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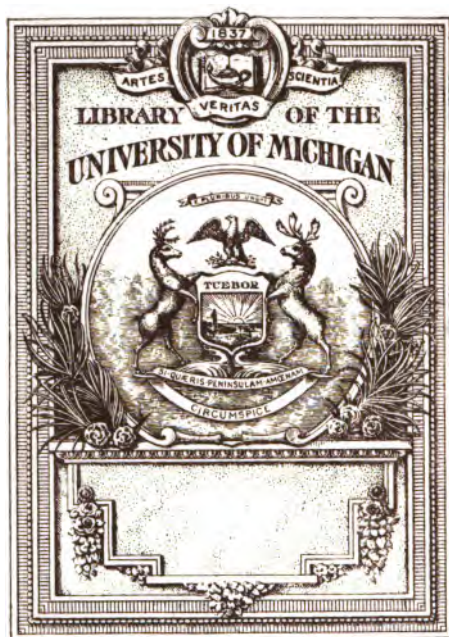
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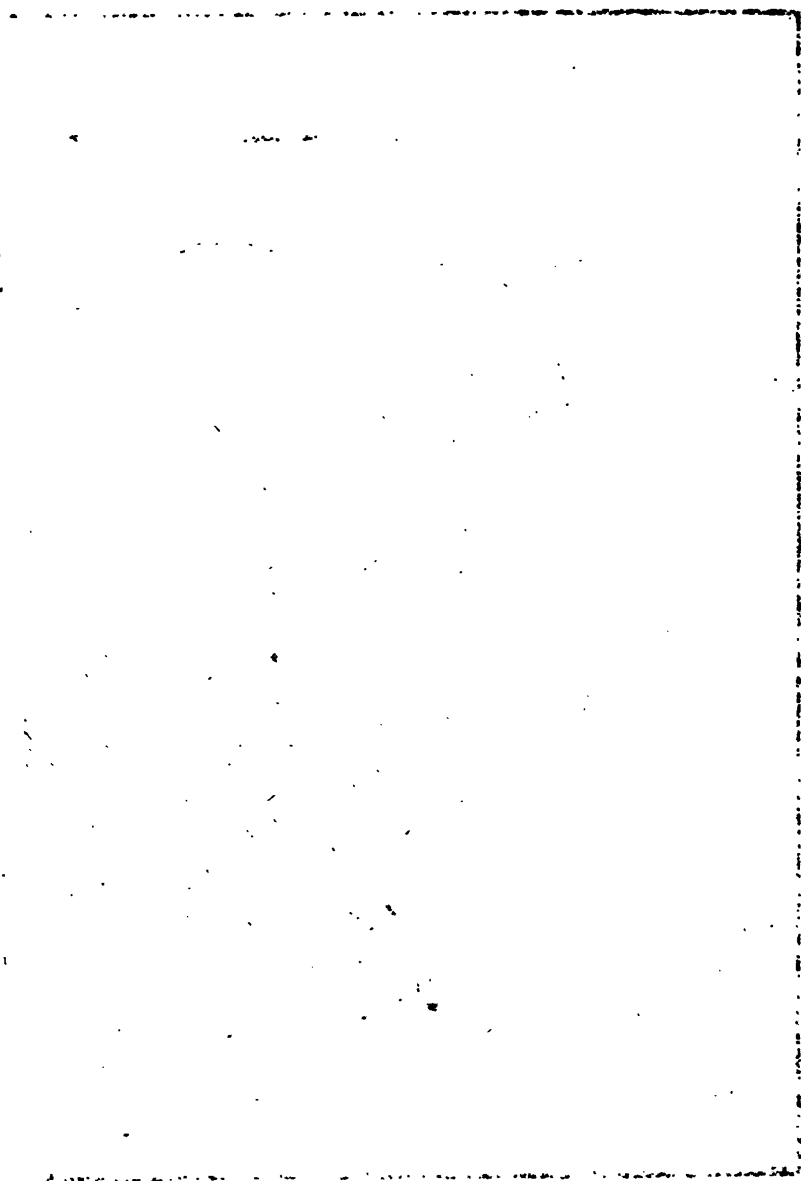
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RUTGERS COLLEGE

CHARTERED 1766 AS QUEEN'S COLLEGE

Catalog for 1916-1917



NEW BRUNSWICK, NEW JERSEY
PUBLISHED BY THE COLLEGE

DECEMBER, 1916

77

CORPORATE TITLE

"The Trustees of Rutgers College in New Jersey"

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1916

1917

1918

JULY							JANUARY							JULY							JANUARY						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
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9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12
23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
30	31																										
AUGUST							FEBRUARY							AUGUST							FEBRUARY						
1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
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13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9
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8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11
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DECEMBER							JUNE							DECEMBER							JUNE						
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8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11
22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
29	30	31																									

COLLEGE CALENDAR

Academic Year 1916-1917

<i>Sept. 28 Thursday</i>	}	Beginning Thursday 9 a. m.:
<i>Sept. 29 Friday</i>		Examinations for admission
<i>Sept. 30 Saturday</i>		Examinations for removal of deficiencies
<i>Oct. 3 Tuesday</i>		First term begins 8:20 a. m.; classes 10.30 a. m.
<i>Oct. 12 Thursday</i>	}	Celebration of the 150th Anniversary of the founding of the College
<i>to</i>		
<i>Oct. 15 Sunday</i>		
<i>Oct. 13 Friday</i>		Meeting of the Board of Trustees 2 p. m.
<i>Nov. 7 Tuesday</i>		Election Day
<i>Nov. 10 Friday</i>		Charter Day
<i>Nov. 29 Wednesday</i>		Thanksgiving recess begins 12:30 p. m.
<i>Dec. 4 Monday</i>		Thanksgiving recess ends 8:20 a. m.
<i>Dec. 22 Friday</i>		Christmas recess begins 4:30 p. m.
<i>Jan. 3 Wednesday</i>		Christmas recess ends 8:20 a. m.
<i>Jan. 9 Tuesday</i>		Meeting of the Board of Trustees 2 p. m.
<i>Jan. 25 Thursday</i>		First term examinations begin
<i>Jan. 28 Sunday</i>		Day of Prayer for Colleges
<i>Feb. 3 Saturday</i>		First term examinations end
 <i>Feb. 4 Sunday</i>		 Second term begins
<i>Feb. 5 Monday</i>		Last day for submitting subjects of theses
<i>Feb. 22 Thursday</i>		Washington's Birthday
<i>Apr. 4 Wednesday</i>		Spring recess begins 4:30 p. m.
<i>Apr. 11 Wednesday</i>		Spring recess ends 8:20 a. m.
<i>Apr. 13 Friday</i>		Meeting of the Board of Trustees 2 p. m.
<i>May 18 Friday</i>		Exhibition Drill 4 p. m.
<i>May 24 Thursday</i>		Senior examinations begin
<i>May 25 Friday</i>		Last day for submitting graduation theses
<i>May 29 Tuesday</i>		Drawing for dormitory rooms 4 p. m.
<i>May 30 Wednesday</i>		Memorial Day
<i>May 31 Thursday</i>		Examinations of lower classes begin
<i>June 1 Friday</i>	}	Competitive examinations in each county of New Jersey for State Scholarships
<i>June 2 Saturday</i>		
<i>June 2 Saturday</i>		
<i>June 2 Saturday</i>		Senior examinations end
<i>June 9 Saturday</i>		Examinations of lower classes end

<i>June 10 Sunday</i>	Baccalaureate Sermon 7:30 p. m.
<i>June 11 Monday</i>	Junior Orations 8 p. m.
<i>June 12 Tuesday</i>	Meeting of the Board of Trustees 9:30 a. m. Annual meeting of the Alumni 10:30 a. m. 151st Annual Commencement 11:30 a. m. Alumni Dinner 1:30 p. m.
<i>June 18 Monday</i> <i>to</i> <i>June 23 Saturday</i>	Examinations of the College Entrance Examination Board

Academic Year 1917-1918

<i>Sept. 17 Monday</i>	Beginning Monday 9 a. m.
<i>Sept. 18 Tuesday</i>	Examinations for admission
<i>Sept. 19 Wednesday</i>	Examinations for removal of deficiencies
<i>Sept. 19 Wednesday</i>	First term begins 8:20 a. m.; classes 10:30 a. m.
<i>Oct. 12 Friday</i>	Meeting of the Board of Trustees 2 p. m.
<i>Nov. 6 Tuesday</i>	Election Day
<i>Nov. 10 Saturday</i>	Charter Day
<i>Nov. 28 Wednesday</i>	Thanksgiving recess begins 12:30 p. m.
<i>Dec. 3 Monday</i>	Thanksgiving recess ends 8:20 a. m.
<i>Dec. 22 Saturday</i>	Christmas recess begins 12:30 p. m.
<i>Jan. 3 Thursday</i>	Christmas recess ends 8:20 a. m.
<i>Jan. 8 Tuesday</i>	Meeting of the Board of Trustees 2 p. m.
<i>Jan. 24 Thursday</i>	First term examinations begin
<i>Jan. 27 Sunday</i>	Day of Prayer for Colleges
<i>Feb. 2 Saturday</i>	First term examinations end
<i>Feb. 3 Sunday</i>	Second term begins
<i>Feb. 22 Friday</i>	Washington's Birthday
<i>Mar. 27 Wednesday</i>	Spring recess begins 4:30 p. m.
<i>Apr. 3 Wednesday</i>	Spring recess ends 8:20 a. m.
<i>Apr. 12 Friday</i>	Meeting of the Board of Trustees 2 p. m.
<i>May 17 Friday</i>	Exhibition Drill
<i>May 23 Thursday</i>	Senior examinations begin
<i>May 30 Thursday</i>	Memorial Day
<i>May 31 Friday</i>	Examinations of lower classes begin
<i>June 11 Tuesday</i>	152d Annual Commencement

BOARD OF TRUSTEES

EX OFFICIO

HIS EXCELLENCY JAMES F. FIELDER, LL.D. <i>Governor of the State of New Jersey</i>	Trenton
HON. WILLIAM S. GUMMERE, LL.D. <i>Chief Justice of the State of New Jersey</i>	Newark
HON. JOHN W. WESCOTT, B.A., LL.B. <i>Attorney-General of the State of New Jersey</i>	Trenton

BY ELECTION

	<i>Date of Election</i>
REV. WM. H. S. DEMAREST, D.D., LL.D. <i>President of the College</i>	March 7, 1899
DAVID BINGHAM, ESQ. East Orange	March 7, 1882
TUNIS G. BERGEN, Ph.D. Brooklyn, N. Y.	June 19, 1883
FREDERICK FRELINGHUYSEN, A.M., LL.D. Newark	June 16, 1885
JAMES NEILSON, A.M., LL.B. New Brunswick	June 22, 1886
FREDERICK J. COLLIER, A.M. Hudson, N. Y.	June 16, 1891
PAUL COOK, A.M. Troy, N. Y.	June 16, 1891
WILLIAM H. LEUPP, A.M. New Brunswick	June 18, 1895
REV. J. PRESTON SEARLE, D.D. New Brunswick	June 21, 1898

	<i>Date of Election</i>
JOHN W. HERBERT, JR., M.Sc., LL.B. Helmetta	June 19, 1901
HON. WILLIAM H. VREDENBURGH, LL.D. Freehold	March 4, 1902
HON. FOSTER M. VOORHEES, LL.D. Elizabeth	October 28, 1902
HON. ALPHONSO T. CLEARWATER, LL.D. Kingston, N. Y.	January 14, 1904
HOWARD N. FULLER, A.M. Albany, N. Y.	January 12, 1905
L. LAFLIN KELLOGG, LL.D. New York, N. Y.	January 12, 1905
REV. JOSEPH R. DURYEE, D.D. New York, N. Y.	March 7, 1905
PHILIP M. BRETT, A.B., LL.B. New York, N. Y.	January 11, 1906
CHARLES L. EDGAR, E.E. Boston, Mass.	October 12, 1906
W. EDWIN FLORANCE, A.M. New Brunswick	October 12, 1906
DRURY W. COOPER, A.B., LL.B. Montclair	October 9, 1908
REV. WILLIAM I. CHAMBERLAIN, D.D. New York, N. Y.	October 8, 1909
LEONOR F. LOREE, M.Sc., C.E. New York, N. Y.	October 8, 1909
DUNCAN D. SUTPHEN, A.B. New York, N. Y.	October 8, 1909

	<i>Date of Election</i>
REV. HENRY EVERTSON COBB, D.D. New York, N. Y.	October 13, 1911
REV. WILLIAM BANCROFT HILL, D.D. Poughkeepsie, N. Y.	January 9, 1912
HON. WILLIAM SHIELDS MYERS, D.Sc. New York, N. Y.	April 12, 1912
HOWARD ELTING, B.Sc. Chicago, Ill.	October 11, 1912
HON. ALFRED F. SKINNER, A.B. Newark	April 11, 1913
HON. GILBERT D. B. HASBROUCK, A.M. Kingston, N. Y.	October 10, 1913
REV. JOHN HOWARD RAVEN, D.D. New Brunswick	January 13, 1914
OTTO HERMANN KAHN, ESQ. Morristown	April 17, 1914
ALAN HARTWELL STRONG, A.M. New Brunswick	June 16, 1914
HOLMES VAN MATER DENNIS, JR., A.M., LL.B. New Brunswick	June 15, 1915
JOHN WYCKOFF METTLER, M.Sc., LL.B. Millstone	January 11, 1916
ERNEST R. ACKERMAN, ESQ. Plainfield	November 24, 1916
J. AMORY HASKELL, ESQ. Red Bank	January 9, 1917

OFFICERS OF THE BOARD

REV. J. PRESTON SEARLE, D.D.	New Brunswick
<i>Secretary</i>	
HENRY PARSELL SCHNEEWEISS, A.B.	New Brunswick
<i>Treasurer</i>	

STATED MEETINGS OF THE BOARD

Second Friday in October, second Tuesday in January,
and second Friday in April at 2 p. m.; Commencement
day at 9:30 a. m.

STANDING COMMITTEES OF THE BOARD

FINANCE—Messrs. Frelinghuysen, Herbert, Leupp, Loree,
Neilson

INSTRUCTION AND DISCIPLINE—Messrs. Bergen, Chamberlain, Cobb, Duryee, Kellogg

FARM, EXPERIMENT STATION, AND CERAMICS—Messrs. Cook,
Leupp, Myers, Neilson, Voorhees

PREPARATORY SCHOOL—Messrs. Brett, Dennis, Herbert,
Mettler, Raven

BUILDINGS AND GROUNDS—Messrs. Florance, Loree, Mettler,
Myers, Strong

LIBRARY—Messrs. Clearwater, Hasbrouck, Hill, Kellogg,
Voorhees

HONORARY DEGREES—Messrs. Brett, Chamberlain, Cobb,
Edgar, Fuller, Skinner

TRUSTEES—Messrs. Duryee, Frelinghuysen, Fuller, Searle,
Sutphen

BENEFICIARY TRUSTS—Messrs. Bingham, Collier, Florance,
Raven, Vredenburg

ADVISORY—Messrs. Florance, Frelinghuysen, Neilson, Searle,
Skinner

BOARD OF VISITORS OF STATE COLLEGE

APPOINTED FROM THE TWELVE CONGRESSIONAL DISTRICTS

1st	{	EPHRAIM T. GILL.....	Haddonfield
Dist.	{	WILBUR BECKETT.....	Swedesboro
2d	{	RHOSHA THOMPSON.....	Wrightstown
Dist.	{	CHARLES F. SEABROOK.....	Bridgeton
3d	{	JAMES C. RICHDALE.....	Phalanx
Dist.	{	JAMES NEILSON.....	New Brunswick
4th	{	JOSIAH T. ALLINSON.....	Yardville
Dist.	{	JOHN DAWES, JR.....	Lebanon
5th	{	DANIEL B. WADE.....	Union
Dist.	{	THEODORE F. KING.....	Ledgewood
6th	{	NICODEMUS WARNE.....	Broadway
Dist.	{	FREDERICK M. CURTIS.....	Harrington Park
7th	{	JOHN HOLBACK.....	Paterson
Dist.	{	HENRY MARELLI.....	Paterson
8th	{	VACANCY	
Dist.	{	JAMES MCCARTHY.....	Jersey City
9th	{	GEORGE SMITH.....	East Orange
Dist.	{	WILLIAM REID.....	Orange
10th	{	GEORGE E. DECAMP.....	Roseland
Dist.	{	HARRY BACKUS.....	Caldwell
11th	{	HERMAN C. LANGE.....	Hoboken
Dist.	{	RICHARD B. MEANY.....	Weehawken
12th	{	ADDISON T. HASTINGS, JR.....	Jersey City
Dist.	{	JOHN R. HARTUNG.....	Jersey City

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GEORGE E. DECAMP, *Vice-President*

IRVING E. QUACKENBOSS, *Secretary and Treasurer*

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Emeritus Professor of Education and Education of Chemistry

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Rutgers
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B.Sc. M.Sc. M.B.A. Ag. C.E. S.D. Harvard
Professor of Biology and Horticulture

* Died December 15, 1911.

* Died February 1, 1912.

-
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Associate Professor of the German Language and Literature
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Professor of Romance Languages
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B.Sc. (Rutgers); M.A., Ph.D. (Univ. Penn.)
Associate Professor of Chemistry

HENRY BRIGGS NORTH 21 Huntington Street
Ph.G., B.S., M.A. (Univ. Wis.); D.Sc. (Paris)
Associate Professor of Chemistry

*CLARENCE WARD 239 Lincoln Avenue
A.B., A.M., Ph.D. (Princeton)
Associate Professor of Architecture
Van Campen Taylor Foundation

AUGUSTINE WILBERFORCE BLAIR 202 Lawrence Avenue
B.S., A.M. (Haverford)
Associate Professor of Agricultural Chemistry

WILLIAM BERTRAM TWISS 304 Lincoln Avenue
A.B. (Dartmouth); A.M. (Harvard)
Associate Professor of English

* Resigned December 1, 1916.

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- *FRANK RANDALL PRATT 4 Union Street
B.Sc., M.Sc. (Rutgers)
Assistant Professor of Physics
- ALBERT RITTENHOUSE JOHNSON 68 North Sixth Avenue
B.Sc. (Rutgers)
Assistant Professor of Mathematics and Graphics
- WILLIAM BEVERLEY STONE 125 John Howard Ford Dormitory
B.A., M.A., Ph.D. (Univ. Virginia)
Assistant Professor of Mathematics
- FREDERICK FRELINGHUYSEN COUCH 309 Grant Avenue
M.E. (Lehigh)
Assistant Professor of Mechanical Engineering
- EDWARD FRANKLIN HAUCH 26 Hardenbergh Street
B.A. (Toronto); M.A., Ph.D. (Columbia)
Assistant Professor of German
- HARRY NELSON LENDALL The Bayard
B.S. in C.E. (Tufts)
Assistant Professor of Civil Engineering
- FRANK APP Alumni and Faculty House
B.S. (Penn. State Coll.)
Assistant Professor of Agronomy
- JOHN PUTNAM HELYAR 56 North Sixth Avenue
B.S., M.S. (Univ. Vt.)
Assistant Professor of Botany
- STUART AUGUSTUS STEPHENSON, JR. 266 Redmond Street
B.S., C.E. (New York Univ.)
Assistant Professor of Civil Engineering
- CHARLES HALE Alumni and Faculty House
Assistant Professor of English
- ARTHUR JAMES FARLEY 275 George Street
B.S. (Mass. Agr. Coll.)
Assistant Professor of Horticulture

* On leave of absence 1917-1918.

OTHER OFFICERS OF INSTRUCTION

JOHN HOWARD RAVEN 185 College Avenue
A.B., A.M., D.D. (Rutgers)
Instructor in Hebrew

HENRY BARNARD KÜMMEL Trenton
A.B. (Beloit); A.M. (Harvard); Ph.D. (Chicago)
State Geologist of New Jersey
Lecturer on the Geology of New Jersey

LEIGH WADSWORTH KIMBALL 24 Seventh Avenue
A.B. (Dartmouth); A.M. (Syracuse)
Instructor in Romance Languages

LYMAN GIBBS SCHERMERHORN 19 First Avenue
B.S. (Mass. Agr. Coll.)
Instructor in Vegetable Gardening

MAYNE SEGUINE MASON 134 John Howard Ford Dormitory
B.S., M.S. (Univ. Illinois)
Instructor in Electrical Engineering

LLOYD STEPHEN RIFORD Farm House, College Farm
B.S. (New Hampshire Agr. Coll.); A.M. (Univ. Missouri)
Instructor in Dairy Husbandry

ROY FOSTER IRVIN 151 George Street
B.S. (Mich. Agr. Coll.)
Instructor in Poultry Husbandry

NORMAN SALLIE PARKER 258 Redmond Street
A.B. (Chicago); A.M. (Harvard); Ph.D. (Chicago)
Instructor in History

CHARLES FRANCIS GEIGER 219 Lawrence Avenue
B.S. (Univ. Illinois)
Instructor in Ceramics

MORELL BRAINARD BAKER 121 Codwise Avenue
A.B., A.M. (Univ. Mich.)
Instructor in Physics

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B.S. (Knox); M.A., Ph.D. (Univ. Illinois)
Instructor in Entomology
- WILLARD CHANDLER THOMPSON 17 Jones Avenue
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Instructor in Poultry Husbandry
- EDWARD FRANCIS JOHNSON Seminary Place
A.B. (Rutgers)
Instructor in German and English
- WILLIAM DANIEL REES 24 College Avenue
B.A. (Ohio State Univ.)
Instructor in Mathematics
- SHERLEY WARNER MORGAN Princeton
A.B. (Princeton)
Instructor in Architecture
- *GEORGE ANDREW WILLIAMS 164 New Street
B.S. (Alfred Univ.)
Instructor in Ceramics
- BRYCE INGLIS MACDONALD 321 John Howard Ford Dormitory
B.Sc. (Rutgers)
Assistant in Chemistry
- JOHN MARSHALL HUNTER Farm House, College Farm
B.S. (Iowa State Coll.)
Assistant in Animal Husbandry
- RICHARD ASHMAN 79 Paterson Street
Litt.B. (Rutgers)
Assistant in Zoology
- EDWARD ROBERT SCHMID 134 John Howard Ford Dormitory
B.Sc., M.Sc. (Rutgers)
Assistant in Chemistry

* Resigned December 31, 1916.

CLIFFORD JAMES COLVILLE 32½ John Howard Ford Dormitory
 B.Sc. Rutgers
Assistant in Chemistry

JAMES CLAUDE THOMSON 11 Union Street
 B.Sc. B.D. M.Sc. Rutgers ; M.A. Columbia
Assistant in Chemistry

JAMES HERBERT KELLEY 53½ George Street
Swimming Instructor

WILLIAM F. WHITE 11 Vinton Street
 First Sergeant U. S. Infantry Reserve
Assistant in the Military Department

CHARLES F. SILBERT 51 Louis Street
 Sergeant U. S. Infantry
Assistant in the Military Department

ALBERT ERLANDER 51 Louis Street
 Sergeant U. S. Infantry
Assistant in the Military Department

WILLIAM JOHN HAZEL 111 Eighth Avenue
Assistant in Physical Training

OFFICERS OF ADMINISTRATION

WILLIAM H. S. DEMAREST, D.D., LL.D. Seminary Place
President

LOUIS BEVIER, Ph.D., Litt.D. Bishop Place
Dean of the College

ALFRED ALEXANDER TITSWORTH, D.Sc. 590 George Street
Dean of Engineering

JACOB GOODALE LIPMAN, Ph.D. College Farm
Dean of Agriculture
Director of the Agricultural Experiment Stations

FREDERICK CHARLES MINKLER, B.S. 47 Nichol Avenue
Director of Short Courses in Agriculture

ALVA AGEE, M.S. 43 Mine Street
Director of Agricultural Extension Work

CHARLES HERBERT ELLIOTT, Ph.D. 8 Richardson Street
Director of the Summer Session

HENRY PARSELL SCHNEEWEISS, A.B. 49 Bayard Street
Treasurer

GEORGE AUGUSTUS OSBORN, B.Sc. 220 Lawrence Avenue
Librarian

LUTHER HARNED MARTIN Alumni and Faculty House
Registrar and Secretary of the Faculty

-
- *MARY GILLESPIE, A.B.** 17 Huntington Street
Assistant Librarian
- CATHERINE L. DAVIDSON** Seminary Place
Secretary to the President
- EARL REED SILVERS, A.B.** Alumni and Faculty House
Assistant to the President
- WILLIAM SEYMOUR VALIANT** 132 New Street
Curator of the Geological Museum
- THEODORE HOWARD SMITH** 94 College Avenue
Assistant to the Treasurer
- MARION CUSHMAN** 240 Raritan Avenue
Assistant in the Library
- CARITA JUDD** 145 College Avenue
Assistant in the Library
- GEORGE MERRIAM WEIGEL** 236 Grant Avenue
Assistant in the Registrar's Office
- EDITH BERGEN** 57 Railroad Avenue
Assistant in the Treasurer's Office
- ALEXANDER STUART GRAHAM** 214 Hale Street
Assistant in the Library
- GERTRUDE OLGA BROFFE** 149 Livingston Avenue
Assistant in the Library
- RALPH WHITAKER VOORHEES, A.B.** Alumni and Faculty House
Field Secretary of the Alumni Association
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* Resigned November 30, 1916.

DANIEL STEVENSON SMART, A.B. 2 Winants Hall
General Secretary of Young Men's Christian Association

HOWARD DECKER MCKINNEY, Litt.B. 586 George Street
Director of Music

1912-1913**HUGO DE VRIES, Sc.D., LL.D.**

Professor of Botany, University of Amsterdam

GEORGE E. VINCENT, Ph.D., LL.D.

President of the University of Minnesota

1913-1914**HAMILTON WRIGHT MABIE, L.H.D.**Author; Associate Editor of *The Outlook***DAN CRAWFORD, F.R.G.S.**

Missionary to Central Africa

DEAN C. WORCESTER, A.B.

Secretary of the Interior, Philippine Islands, 1901-1913

1914-1915**JOHN GRIER HIBBEN, Ph.D., LL.D.**

President of Princeton University

ALFRED NOYES, Litt.D.

Visiting Professor at Princeton

LEONARD C. VAN NOPPEN, A.M.

Queen Wilhelmina Lecturer at Columbia University

1915-1916**HON. HENRY ST. GEORGE TUCKER, LL.D.**Lately Dean of Law Department
Washington and Lee University**DAVID STARR JORDAN, LL.D.**

Chancellor of Stanford University

ORGANIZATION

RUTGERS COLLEGE was founded as Queen's College November 10, 1766. It was the eighth college founded in the American colonies and had its origin in the zeal for education and religion shown by the Dutch colonists in New York and New Jersey. Early in the eighteenth century the Reverend Theodorus Jacobus Frelinghuysen, distinguished pastor and evangelist, urged the erection of such a college. His son, the Reverend Theodorus Frelinghuysen, continued the effort, persistently seeking the necessary sympathy and resources both in this country and Holland. As the movement came to successful issue the Reverend Jacob Rutsen Hardenbergh, afterwards president of the College, was the leader. With each of these ministers Hendrick Fisher, president of the first Provincial Congress of New Jersey, was the layman most actively associated.

The charter was granted in the name of George the Third by His Excellency William Franklin, governor of the Province of New Jersey. No copy of this document is now known to be in existence, but under its provisions the Board of Trustees was created and meetings were called. A second charter was granted March 20, 1770, in answer to the Trustees' desire for slight amendment and under its provisions, almost unchanged, the institution has continued until now. It provides for a college to be called Queen's College in honor of the royal consort, Charlotte, and to be erected for "the education of youth in the learned languages, liberal and useful arts and sciences, and especially in divinity." The college was located by the Trustees at New Brunswick, New Jersey, where it has occupied successively three sites.

During the Revolutionary War its activities were at different times removed to neighboring villages and the tutors in charge, Colonel Frederick Frelinghuysen and Colonel John Taylor, were frequently called away for the civil and military service which they so patriotically and conspicuously fulfilled. In 1808 the present campus was acquired and the erection of the college hall, still called Queen's Building, was begun.

In 1825, after receiving generous gifts from Colonel Henry Rutgers of New York and in recognition of his widespread benevolent donations, the Trustees secured amendment of the charter changing the name from Queen's to Rutgers College. From that time Rutgers College has maintained a continuous work of liberal education, increasing from time to time its corps of professors and instructors, its buildings and equipment, its number of students and graduates. The course of study maintained from the origin of the College has been a classical or liberal arts course leading to the degree of Bachelor of Arts (A.B.). In 1864 the Trustees organized a course of study leading to the degree of Bachelor of Science (B.Sc.) and on April 4 of that year the State of New Jersey declared "The Trustees of Rutgers College in New Jersey, maintaining Rutgers Scientific School," to be "The State College for the Benefit of Agriculture and the Mechanic Arts." Since 1901 a course of study leading to the degree of Bachelor of Letters (Litt.B.) has also been maintained. Courses of graduate study leading to advanced degrees have been recently organized in several departments.

The corporate title of the College is "The Trustees of Rutgers College in New Jersey."

REQUIREMENTS FOR ADMISSION

EVERY applicant for admission must submit to the President proper testimonials of a good moral character. An applicant for a State scholarship must also submit a certificate of appointment.

The requirements for admission to any of the four-year courses amount to 15 points, a "point" representing "a year's study in any subject in a secondary school, constituting approximately a quarter of a full year's work." The specific requirements for the various courses are shown in the table below and are described in detail in the following pages:

Bachelor of Arts and Letters

<i>Required</i>		<i>The additional points may be offered in the following subjects:</i>	
English.....	3	Greek.....	3
Mathematics.....	3	German.....	3
Ancient History.....	1	French.....	3
Latin.....	4	Science.....	1
	—	History.....	1
	11		
Additional points.....	4		
	—		
	15		

General Bachelor of Science

<i>Required</i>		<i>The additional points may be offered in the following subjects:</i>	
English.....	3	History.....	1 or 2
Mathematics.....	3	French.....	2 or 3
History.....	1	German.....	2 or 3
Science.....	1	Science.....	1 or 2
Foreign Language.....	3	Latin.....	2, 3, or 4
	—		
	11		
Additional points.....	4		
	—		
	15		

Technical Bachelor of Science in Engineering, Chemistry, and Ceramics

<i>Required</i>		<i>The additional points may be offered in the following subjects:</i>	
English.....	3		
Mathematics.....	4	French.....	2 or 3
Science.....	1	German.....	2 or 3
History.....	1	Latin.....	2, 3, or 4
Foreign Language.....	2	History.....	1 or 2
	11	Science.....	1 or 2
Additional points.....	4	Draughting.....	$\frac{1}{2}$
	15		

Technical Bachelor of Science in Agriculture and Biology

<i>Required</i>		<i>The additional points may be offered in the following subjects:</i>	
English.....	3		
Mathematics.....	$3\frac{1}{2}$	Plane Trigonometry.....	$\frac{1}{2}$
Science.....	1	French.....	2 or 3
History.....	1	German.....	2 or 3
Foreign Language.....	2	Latin.....	2, 3, or 4
	$10\frac{1}{2}$	History.....	1 or 2
Additional points.....	$4\frac{1}{2}$	Science.....	1 or 2
	15	Draughting.....	$\frac{1}{2}$

In the Bachelor of Arts course students admitted without Greek take that subject in College for at least two years.

In fulfilment of the German and French requirements for entrance to the Bachelor of Science courses not less than two nor more than three years will be credited in one language. Attention is called to the texts specified for the French examinations.

Beginning in September, 1918, a test of pronunciation and of ability to understand the language when spoken or dictated will be given during the first month of the term to all students who have offered modern languages for admission.

Detailed information may be found in the statements for the several subjects, which are arranged alphabetically on the subsequent pages.

Concerning requirements for admission to the short course in Clay-working and the short courses in Agriculture see page 46.

REQUIREMENTS IN ENGLISH

All Courses, Required

The requirements adopted by the National Conference on Uniform Entrance Requirements in English are in force for admission to all courses and are equated as three points.

Preparation in English has two main objects: (1) command of correct and clear English, spoken and written; (2) ability to read with accuracy, intelligence, and appreciation.

English Grammar and Composition

The first object requires instruction in grammar and composition. English grammar should ordinarily be reviewed in the secondary school, and correct spelling and grammatical accuracy should be rigorously exacted in connection with all written work during the four years. The principles of English composition governing punctuation, the use of words, paragraphs, and the different kinds of whole composition, including letter-writing, should be thoroughly mastered; and practice in composition, oral as well as written, should extend throughout the secondary school period. Written exercises may well comprise narration, description, and easy exposition and argument based upon simple outlines. It is advisable that subjects for this work be taken from the student's personal experience, general knowledge, and studies other than English, as well as from his reading and from literature. Finally, special instruction in language and composition should be accompanied by concerted effort of teachers in all branches to cultivate in the student the habit of using good English in his recitations and various exercises, whether oral or written.

Literature

The second object is sought by means of two lists of books below, headed respectively **READING** and **STUDY**, from which may be framed a progressive course in literature covering four years. In connection with both lists the student should be trained in reading aloud and be encouraged to commit to memory some of the more notable passages, both in verse and in prose. As an aid to literary appreciation he is further advised to acquaint himself with the most important facts in the lives of the authors whose work he reads and with their place in literary history.

For the examinations in 1917, 1918, and 1919:

(A) READING. The aim of this course is to foster in the student the habit of intelligent reading and to develop a taste for good literature by giving him a first-hand knowledge of some of its best specimens. He should read the books carefully, but his attention should not be so fixed upon details that he fails to appreciate the main purpose and charm of what he reads.

With a view to large freedom of choice, the books provided for reading are arranged in the following groups, from each of which at least two selections are to be made, except as otherwise provided under Group I.

GROUP I. CLASSICS IN TRANSLATION.—The Old Testament, comprising at least the chief narrative episodes in Genesis, Exodus, Joshua, Judges, Samuel, Kings, and Daniel, together with the books of Ruth and Esther; the Odyssey, with the omission, if desired, of Books I, II, III, IV, V, XV, XVI, XVII; the Iliad, with the omission, if desired, of Books XI, XIII, XIV, XV, XVII, XXI; the Aeneid; the Odyssey, Iliad, and Aeneid should be read in English translations of recognized literary excellence.

For any selection from this group a selection from any other group may be substituted.

GROUP II. SHAKESPEARE.—Midsummer Night's Dream; Merchant of Venice; As You Like It; Twelfth Night; The Tempest; Romeo and Juliet; King John; Richard II; Richard III; Henry V; Coriolanus; and if not chosen for study under B, Julius Caesar; Macbeth; Hamlet.

GROUP III. PROSE FICTION.—Malory's Morte d'Arthur (about 100 pages); Bunyan's Pilgrim's Progress, Part I; Swift's Gulliver's Travels (voyages to Lilliput and to Brobdingnag); Defoe's Robinson Crusoe, Part I; Goldsmith's Vicar of Wakefield; Frances Burney's Evelina; Scott's Novels, any one; Jane Austen's Novels, any one; Maria Edgeworth's Castle Rackrent, or The Absentee; Dickens's Novels, any one; Thackeray's Novels, any one; George Eliot's Novels, any one; Mrs. Gaskell's Cranford; Kingsley's Westward Ho! or Hereward, the Wake; Reade's The Cloister and the Hearth; Blackmore's Lorna Doone; Hughes's Tom Brown's Schooldays; Stevenson's Treasure Island, or Kidnapped, or Master of Ballantrae; Cooper's Novels,

any one; Poe's Selected Tales; Hawthorne's The House of the Seven Gables, or Twice Told Tales, or Mosses from an Old Manse; a collection of Short Stories by various standard writers.

GROUP IV. ESSAYS, BIOGRAPHY, ETC.—Addison and Steele's The Sir Roger de Coverley Papers, or selections from the *Taller* and *Spectator* (about 200 pages); Boswell's Life of Johnson (selections from, about 200 pages); Franklin's Autobiography; Irving's Sketch Book (selections from, about 200 pages), or Life of Goldsmith; Southey's Life of Nelson; Lamb's Essays of Elia (selections from, about 100 pages); Lockhart's Life of Scott (selections from, about 200 pages); Thackeray's Lectures on Swift, Addison, and Steele in the English Humorists; Macaulay's essays on Lord Clive, Warren Hastings, Milton, Addison, Goldsmith, Frederic the Great, Madame d'Arblay (any one); Trevelyan's Life of Macaulay (selections from, about 200 pages); Ruskin's Sesame and Lilies, or Selections (about 150 pages); Dana's Two Years before the Mast; Lincoln: selections, including at least the two Inaugurals, the Speeches in Independence Hall and at Gettysburg, the Last Public Address, the Letter to Horace Greeley, together with a brief memoir or estimate of Lincoln; Parkman's The Oregon Trail; Thoreau's Walden; Lowell's Selected Essays (about 150 pages); Holmes's The Autocrat of the Breakfast Table; Stevenson's An Inland Voyage and Travels with a Donkey; Huxley's Autobiography and selections from Lay Sermons, including the addresses on Improving Natural Knowledge, A Liberal Education, and A Piece of Chalk; a collection of Essays by Bacon, Lamb, DeQuincey, Hazlitt, Emerson, and later writers; a collection of Letters by various standard writers.

GROUP V. POETRY.—Palgrave's Golden Treasury (First Series), Books II and III, with special attention to Dryden, Collins, Gray, Cowper, and Burns; Palgrave's Golden Treasury (First Series), Book IV, with special attention to Wordsworth, Keats, and Shelley (if not chosen for study under B); Goldsmith's The Traveller and The Deserted Village; Pope's The Rape of the Lock; a collection of English and Scottish Ballads, as, for example, some Robin Hood ballads, The Battle of Otterburn, King Estmere, Young Beichan, Bewick and Grahame, Sir Patrick Spens, and a selection from later ballads; Coleridge's The Ancient Mariner, Christabel, and Kubla Khan; Byron's Childe Harold, Canto III or IV, and The Prisoner of Chillon; Scott's The Lady of the Lake, or Marmion; Macaulay's The Lays of Ancient

Rome, The Battle of Naseby, The Armada, Ivy; Tennyson's The Princess, or Gareth and Lynette, Lancelot and Elaine, and The Passing of Arthur; Browning's Cavalier Tunes, The Lost Leader, How They Brought the Good News from Ghent to Aix, Home Thoughts from Abroad, Home Thoughts from the Sea, Incident of the French Camp, Hervé Riel, Pheidippides, My Last Duchess, Up at a Villa—Down in the City, The Italian in England, The Patriot, The Pied Piper, "De Gustibus"—, Instans Tyrannus; Arnold's Sohrab and Rustum, and The Forsaken Merman; selections from American Poetry, with special attention to Poe, Lowell, Longfellow, and Whittier.

(B) STUDY. This part of the requirement is intended as a natural and logical continuation of the student's earlier reading, with greater stress laid upon form and style, the exact meaning of words and phrases, and the understanding of allusions. The books provided for study are arranged in four groups, from each of which one selection is to be made.

GROUP I. DRAMA.—Shakespeare's Julius Caesar; Macbeth; Hamlet.

GROUP II. POETRY.—Milton's L'Allegro, Il Penseroso, and either Comus or Lycidas; Tennyson's The Coming of Arthur, The Holy Grail, and The Passing of Arthur; the selections from Wordsworth, Keats, and Shelley in Book IV of Palgrave's Golden Treasury (First Series).

GROUP III. ORATORY.—Burke's Speech on Conciliation with America; Macaulay's Two Speeches on Copyright and Lincoln's Speech at Cooper Union; Washington's Farewell Address and Webster's First Bunker Hill Oration.

GROUP IV. ESSAYS.—Carlyle's Essay on Burns, with a selection from Burns's Poems; Macaulay's Life of Johnson; Emerson's Essay on Manners.

Examination

However accurate in subject-matter, no paper will be considered satisfactory if seriously defective in punctuation, spelling or other essentials of good usage.

The examination will be divided into two parts, one of

which will be on grammar and composition and the other on literature.

In grammar and composition the candidate may be asked specific questions upon the practical essentials of these studies, such as the relation of the various parts of a sentence to one another, the construction of individual words in a sentence of reasonable difficulty, and those good usages of modern English that one should know in distinction from current errors. The main test in composition will consist of one or more essays, developing a theme through several paragraphs; the subjects will be drawn from the books read, from the candidate's other studies and from his personal knowledge and experience quite apart from reading. For this purpose the examiner will provide several subjects, perhaps eight or ten, from which the candidate may make his own selections. He will not be expected to write more than four hundred words an hour.

The examination in literature will include:

(A) General questions designed to test such a knowledge and appreciation of literature as may be gained by fulfilling the requirements defined under *READING*, above. The candidate will be required to submit a list of the books read in preparation for the examination, certified by the principal of the school in which he was prepared; but this list will not be made the basis of detailed questions.

(B) A test on the books prescribed for study, which will consist of questions upon their content, form, and structure, and upon the meaning of such words, phrases, and allusions as may be necessary to an understanding of the works and an appreciation of their salient qualities of style. General questions may also be asked concerning the lives of the authors, their other works, and the periods of literary history to which they belong.

REQUIREMENTS IN FRENCH

French is not required for admission to the Bachelor of Arts course.

For admission to the Bachelor of Letters course three years of French or German are required, to be equated as three points.

For admission to the Bachelor of Science courses two or three years of French may be offered, to be equated accordingly.

Candidates offering three years are advised to take the examination in two successive years.

For the guidance of candidates aiming to prepare as definitely and directly as possible for the competitive examinations which determine the award of New Jersey State scholarships, lists are given of the French texts from which the passages for translation will be largely taken. The examination, however, is adapted also to those who have studied texts equivalent in amount and in degree of difficulty.

Bachelor of Letters Course, 3 Years, Optional**Bachelor of Science Courses, 2 or 3 Years, Optional*****A, B (First Two Years)***

Elementary grammar, including especially pronunciation, declension, the elementary rules of syntax, and translation into French (a part orally and a part in writing) of all the English exercises, and in addition the conjugation of the simple and compound tenses of the regular verbs and of all except the rarely used and the defective irregular verbs; this should be reviewed during the second year and greater attention paid to the rules of syntax governing articles, pronouns, prepositions, and the tenses and moods of verbs, and to the application of these rules to the text translated.

About 450 duodecimo pages of simple modern prose should be read as prepared work and 225 pages at sight. Oral and written

drill in making abstracts and reproductions of portions of the text.

The grammar requirement is covered by the first part of Fraser and Squair's *French Grammar* to page 109 inclusive, and the second part from page 129 to 158 inclusive, omitting *férir, fleurir, gésir, issir, ouïr, bruire, clore, frîre, sourdre, tistre, déchoir*, and *échoir*. Any grammar, however, may be used that fills the requirement, for instance, Alexander's, Beebe's, Chardenal's, Downer's, François's, or Olmsted's.

In 1917 the passages for translation will be taken largely from the following: Kuhn's *French Reading for Beginners* (Holt), 100 pages; Verne, *les Enfants du capitaine Grant* (American Book Co.), 79 pages; Labiche et Martin, *la Poudre aux yeux* (American Book Co.), 72 pages; Daudet, *le petit Chose* (Heath), 124 pages; Bazin, *Contes choisis* (Heath), 84 pages.

In 1918, 1919, and 1920 the passages for translation will be taken largely from the following: Bruno, *le Tour de la France* (American Book Co.), 174 pages; Halévy, *l'abbé Constantin* (Holt), 157 pages; Labiche et Martin, *le Voyage de monsieur Perrichon* (Ginn), 76 pages; De Maistre, *la jeune Sibérienne* (Ginn), 61 pages.

C (Third Year)

This should include the translation of several intermediate texts, one at least to be in dramatic form. About 450 pages should be read as prepared work and 225 pages at sight.

A more advanced grammar should be studied, such as Bevier's or the second part of Fraser and Squair's, and its rules applied in the translation of English sentences into French; or for this may be substituted some treatise on syntax and composition, such as Bouvet's, François's (advanced), or Koren's.

In 1917 the passages for translation will be taken largely from the following: Theuriet, *l'abbé Daniel* (Holt), 85 pages; Chateaubriand, *le dernier Abencerage* (American Book Co.), 52 pages; Balzac, *le Curé de Tours* (Heath), 74 pages;

Molière, *le Bourgeois Gentilhomme* (American Book Co.), 101 pages; Loti, *Ramunicho* (Heath), 132 pages.

In 1918, 1919, and 1920 the passages for translation will be taken largely from the following: Molière, *l'Avare* (Heath), 141 pages; Bazin, *les Oberlé* (Heath), 144 pages; Loti, *Pêcheur d'Islande* (Heath), 120 pages; Daudet, *la Belle-Nivernaise* (Ginn), 59 pages.

REQUIREMENTS IN GERMAN

German is not required for admission to the Bachelor of Arts course.

For admission to the Bachelor of Letters course three years of German or French are required, to be equated as three points.

For admission to the Bachelor of Science courses two or three years of German may be offered, to be equated accordingly.

Candidates offering three years are advised to take the examination in two successive years.

Bachelor of Letters Course, 3 Years, Optional

Bachelor of Science Courses, 2 or 3 Years, Optional

A, B (First Two Years)

The preparation should include a thorough grounding in pronunciation, in grammatical inflections, in the principal parts and meanings of the strong and irregular verbs; in word-order, and in translating brief English sentences into German. Also about 300 pages of German narrative and colloquial texts (see suggested list) should be translated into English as prepared work, besides as much sight work as may be possible.

Following is a list of German texts from which selections might be made: Storm's *Immensee*, Hillern's *Höher als die Kirche*, Gerstäcker's *Germelshausen*, Baumbach's *Die Nonna*, Schiller's *Der Neffe als Onkel*, *Das Lied von der Glocke*, Fouqué's *Undine*.

C (Third Year)

The preparation should include the translation into English of about 300 pages of German of a degree of difficulty suggested by the following list of suitable texts from which selections might be made: Baumbach's *Der Schwiegersohn*, Riehl's *Der Fluch der Schönheit* or *Burg Neideck*, Schiller's *Wilhelm Tell*, Lessing's *Minna von Barnhelm*, Goethe's *Hermann und Dorothea*, Freytag's *Die Journalisten*, Heine's *Die Harzreise*, Scheffel's *Der Trompeter von Säckingen*.

Candidates should also have translated into German about 50 pages of connected English discourse and have had as much practice as possible throughout the year in the translation at sight of German into English.

REQUIREMENTS IN GREEK

In Greek the requirement for admission to the Bachelor of Arts course (the only course for which Greek is required) is equated as three points, and is as follows:

Bachelor of Arts Course, Required

A, B (First Two Years)

Grammar

Accent, inflections, and syntax.

Composition

Translation into Greek of easy English sentences based on the vocabulary of Xenophon. Special attention to correctness of accent.

Xenophon

Anabasis, four books.

C (Third Year)

Homer

Iliad, three books (omitting the catalog of the ships), or *Odyssey*, three books. Particular care should be given to scansion.

Sight Reading

Students should be practiced in reading at sight narrative prose not more difficult than the *Anabasis* of Xenophon.

These statements indicate the amount of work presupposed by the entrance examinations, but equivalents from authors not mentioned will be accepted.

REQUIREMENTS IN HISTORY

For admission to the Bachelor of Arts and Bachelor of Letters courses ancient history, one point, is required. In addition either (a) United States history and civics *or* (b) English history *or* (c) medieval and modern history may be offered, and will be equated as one point.

For admission to the Bachelor of Science courses only one point in history is required and this may be any one of the four courses named in the preceding paragraph. Besides the required point, as many as two additional points may be offered toward the total number required for admission.

Ancient History

The examination usually includes eight questions on Greek and Roman history (considered together), one on the oriental nations, and one on the period between the fall of the Western Empire and the year 800 A.D. The applicant should know the main facts of the political, social, religious, and colonial history, and also the physical features of the several lands, and be able to point out on an outline map the divisions of ancient Greece and Rome, the location of the chief cities, islands, etc. Botsford's *A History of the Ancient World* or a similar work may be used for preparation.

English History

The entire scope of English history is covered by the examination. Attention should be given to the rise of the middle class, to the relations of England with the other countries, to the more

prominent features of constitutional progress, to the religious history of the country, and to commerce and colonization. Cheyney's *A Short History of England* has sufficient material for the preparation, especially if used in connection with the same author's volume of *Readings in English History* (Ginn).

Medieval and Modern History

The examination is on the main facts of the history of Western Europe from the time of Charlemagne to the present. Such topics as the following should receive attention: the beginnings of the separate nations; the social, political, and cultural importance of the church; the relations between church and state through the centuries; the main features of the development of the several states; and the relations between the various states. Thatcher and Schwill's *A General History of Europe* or a similar work may be used for preparation.

United States History and Civics

Candidates must have a fair general knowledge of the entire field of our history, including the colonization and government of the several colonies, the machinery of federal, state, and local governments, the various steps in the territorial, social, and political growth of the nation till the end of the nineteenth century. McLaughlin's *History of the American Nation* or a similar work may be used for preparation.

REQUIREMENTS IN LATIN

A standard four-year course in Latin, equated as four points, is required for admission to the Bachelor of Arts and Bachelor of Letters courses.

For admission to the Bachelor of Science course two or three years of Latin may be offered and will be equated accordingly.

The reading of the four-year course should be equal in amount to four books of Caesar's *Gallic War*, six orations of Cicero, and six books of Virgil's *Aeneid*. The works prescribed to be read are Cicero's *Oration on the Manilian Law* and *Oration for Archias*, and Virgil's *Aeneid*, Books

I, II, and either IV or VI. The works from which the remainder of the reading may be selected are Caesar's *Gallie War* and *Civil War*, and the *Lives* of Nepos; Cicero's *Orations*, *Letters*, *De Senectute*, and *De Amicitia*; Sallust's *Catiline* and *Jugurthine War*; Virgil's *Bucolics*, *Georgics*, and *Aeneid*; and Ovid's *Metamorphoses*, *Fasti*, and *Tristia*.

The examinations on the reading will include sight translation of prose and poetry. The examination in Latin prose composition will contain complex sentences illustrating important constructions.

The certificate requirement in Latin prose composition is formulated as the equivalent of one period a week, during the last two years of the school course.

Bachelor of Arts and Bachelor of Letters Courses, Required

Bachelor of Science Courses, 2 or 3 Years, Optional

A, B (First Two Years)

Grammar, inflections and syntax; *Composition*, sentences based on Caesar or Nepos; *Reading*, parts of Caesar, or of Caesar and Nepos, equal in amount to four books of the *Gallie War*.

C (Third Year)

Grammar, as above; *Composition*, complex sentences based on Cicero or Sallust; *Reading*, Cicero's *Oration on the Manilian Law*, *Oration for Archias*, and selections from Cicero or Sallust equal in amount to four orations of Cicero.

D (Fourth Year)

Grammar, as above; *Composition*, as in C; *Reading*, Virgil's *Aeneid*, Books I, II, and either IV or VI, and selections from Virgil or Ovid equal in amount to three books of the *Aeneid*.

REQUIREMENTS IN MATHEMATICS

For admission to the Bachelor of Arts, the Bachelor of Letters, and the general Bachelor of Science courses the

requirement in mathematics is three points: namely, two in algebra and one in plane geometry.

For admission to the technical Bachelor of Science courses in Engineering, Chemistry, and Ceramics four points are required: namely, algebra two, plane geometry one, solid geometry one-half, and plane trigonometry one-half. For the courses in Agriculture and Biology, plane trigonometry is not required.

Students are advised thoroughly to review algebra within a year before entering.

All Courses, Required

Algebra A (To Quadratics)

A thorough drill in the four fundamental operations; factoring; the greatest common divisor, both by inspection and by division; least common multiple; fractions, including complex fractions; equations of the first degree containing one or more unknowns; problems leading to equations of the first degree; involution and evolution of polynomials and numbers; the theory of exponents; properties of quadratic surds, including binomial surds; rationalization of the denominator; solutions of equations containing surds and radicals.

Algebra B (Quadratics and beyond)

The theory of quadratic equations; quadratic equations of one or more unknowns, and simultaneous equations, with applications; inequalities; ratio and proportion; the binomial theorem for positive integral exponents; the graphs of first and second degree expressions; logarithms; arithmetic and geometric progressions.

Plane Geometry

The whole of plane geometry, as contained in the standard texts. Much stress should be placed on the demonstration of original exercises.

Technical Bachelor of Science Courses, Required

Plane trigonometry is not required for admission to the courses in Agriculture and Biology.

Solid Geometry

The whole of solid geometry as contained in the standard texts, including the relations of planes and lines in space, the properties of prisms, pyramids, cylinders, and cones, and the sphere and the spherical triangle. The solution of original exercises and numerical problems is important.

Plane Trigonometry

The essentials of plane trigonometry as contained in any of the standard texts. Thorough familiarity with the functions of single, double, and half angle together with ability to derive the formulas is most essential. Stress should be placed on the solution of trigonometric identities, on the solution of right and oblique triangles, and on the functions of angles in the four quadrants.

REQUIREMENTS IN SCIENCE

For admission to the Bachelor of Arts and Bachelor of Letters courses one year of experimental science (either physics, or chemistry, or biology) may be offered, and will be equated as one point.

For admission to the Bachelor of Science courses one year of experimental science (either physics or chemistry) is required, and will be equated as one point. Two years of experimental science (physics and chemistry, physics and biology, or chemistry and biology), or three years (physics, chemistry and biology) may be offered, and will be equated accordingly.

Biology is defined as a year's experimental course either in botany, or in zoology, or in botany and zoology.

Bachelor of Science Courses, One or Both*Physics*

Candidates are required to show satisfactory acquaintance with the prominent facts and laws of physics taught in textbooks used in approved schools, familiarity with that branch of physics known as mechanics being particularly desired. The habit of

taking accurate neatly written notes of lectures and laboratory work should be acquired during the preparatory course. Candidates are requested to present laboratory notebooks or certificates from teachers under whom the laboratory work was done.

Chemistry

The student should have a thorough knowledge of the fundamental principles of the science as obtained through study of the metallic and nonmetallic elements accompanied by laboratory exercises.

Bachelor of Science Courses, Optional

Botany

A year's study covering the equivalent of Bergen's *Foundations of Botany* or Coulter's *Plants* or *Plant Studies*, with accompanying laboratory exercises.

Zoology

A year's study covering the equivalent of Hegner's *Practical Zoology* or Linville and Kelly's *General Zoology*. A laboratory notebook is required. The course must include the equivalent of four periods of prepared class work and one double period of laboratory exercises.

Biology

A half year each of botany and zoology equivalent to the courses given in Bigelow's *Applied Biology* or Hunter's *Civic Biology*. In botany a suitable equivalent is Bergen's *Foundations of Botany* or Coulter's *Plant Studies* and in zoology Linville and Kelly's *General Zoology* or Hegner's *Practical Zoology*. The course must include the equivalent of four periods of prepared class work and one double period of laboratory exercises, and a laboratory notebook must be submitted.

ADMISSION WITH CONDITIONS

Candidates who have not satisfied all the requirements for admission to the freshman class may be admitted with conditions by special vote of the Faculty, but such conditions may not exceed a total of two points and must be removed before the beginning of the sophomore year.

ADMISSION TO ADVANCED STUDY

Students may enter advanced classes if they sustain a satisfactory examination or offer adequate credentials to cover both the preliminary studies and those already passed over by the class which they purpose to enter. Full equivalents will be accepted.

ADMISSION TO SHORT COURSES

For admission to the short course in Clay-working the requirements are the same as for the Bachelor of Science courses (page 29), except for young men who have had experience in some manufacturing branch of the ceramic industries. Such applicants are not subject to the regular entrance examinations, but admitted if their qualifications prove satisfactory to the Director of the department of ceramics.

Students are admitted to the short courses in Agriculture without examination. They should have a good common school education, however, in order to make the best use of the instruction given.

MODES OF ADMISSION

EACH requirement for admission to the freshman class may be met by either examination or certificate.

ADMISSION BY EXAMINATION

The candidate for admission may meet the requirements in each subject by any of the following examinations:

- 1 State competitive examinations in each county in New Jersey (on June 1 and 2 in 1917)
- 2 Examinations of the College Entrance Examination Board (June 18 to 23 in 1917)
- 3 Examinations of the College (September 17 and 18 in 1917)
- 4 Examinations of the Regents of the University of the State of New York

State Competitive Examinations

Students from New Jersey will be admitted to any course upon passing the State competitive examinations, which are held annually in each county of the State on the first Friday in June and the Saturday following under the direction of the city and county superintendents of schools. In 1917 these will be held on June 1 and 2. (For the requirements of the State law see page 201.)

Entrance Examination Board

The examinations held by the College Entrance Examination Board in June of each year at various points, including Rutgers College, are accepted in so far as they meet

the requirements for admission. At the College these examinations are held in Geological Hall. In 1917 they will take place June 18 to 23, beginning at 9 a. m.

All applications for examination must be addressed to the Secretary of the College Entrance Examination Board, 431 W. 117th Street, New York, N. Y., and must be made upon a blank form to be obtained from the Secretary of the Board upon request.

Applications for examination at points in the United States east of the Mississippi River, also at points on the Mississippi River, must be received by the Secretary of the Board on or before Monday, June 4, 1917; applications for examination elsewhere in the United States or in Canada must be received on or before Monday, May 28, 1917; and applications for examination outside of the United States and Canada must be received on or before Monday, May 14, 1917.

Applications received later than the dates named will be accepted when it is possible to arrange for the examinations of the candidates concerned, but only upon the payment of \$5 in addition to the usual fee.

The examination fee is \$5 for all candidates examined at points in the United States and Canada and \$15 for all candidates examined outside the United States and Canada. The fee (which cannot be accepted in advance of the application) should be remitted by postal order, express order, or draft on New York to the order of the College Entrance Examination Board.

A list of the places at which examinations are to be held by the Board in June, 1917, will be published about March 1. Requests that the examinations be held at particular points should be transmitted to the Secretary of the Board not later than February 1.

Examinations of the College

Examinations for admission are held by the College in September of each year. In 1917 they will take place in the Registrar's office on the Monday and Tuesday preceding the opening of the College, September 17 and 18, beginning at 9 a. m. on Monday.

Regents' Examinations

The examinations held by the Regents of the University of the State of New York are accepted in place of entrance examinations in the subjects which they cover.

Preliminary Examinations.—It is not necessary that examinations in all the subjects required for admission be taken in the same year. Candidates may offer themselves at any of the examinations specified above within two years and four months of the date when they purpose entering college and be examined on any of the subjects required for admission.

ADMISSION BY CERTIFICATE

Graduates, of not more than twenty-eight months standing, from a four-year or five-year course in an approved secondary school are admitted to the freshman class upon the certificate of the principal.

All four-year secondary schools in New Jersey that are approved by the State Department of Public Instruction are accorded the certificate privilege.

Upon request of the principal or the board of education any school will be investigated and, if approved by the Faculty, will be entitled to the certificate privilege for a period of three years.

Upon application to the Registrar blank forms of certificate will be furnished to schools having this privilege.

School certificates or other credentials should be forwarded to the Registrar as early as possible.

REVISED CURRICULUM

THE curriculum outlined in this chapter will become fully operative in 1917-1918.

LIBERAL COURSES

For the liberal courses leading to the degrees of A.B., Litt B., and B.Sc., the work is to be grouped as follows with a minimum requirement in each group:

GROUP I. ENGLISH LANGUAGE AND LITERATURE.

Minimum requirement for all degrees 8 hours.

GROUP II. FOREIGN LANGUAGES.

Minimum requirement for A.B. and Litt.B. 22 hours; for B.Sc. 14 hours.

GROUP III. MATHEMATICS AND NATURAL SCIENCES.

Minimum requirement for A.B. and Litt.B. 14 hours; for B.Sc. 50 hours.

GROUP IV. HISTORY, POLITICAL SCIENCE, AND SOCIAL SCIENCE.

Minimum requirement for all degrees 10 hours.

GROUP V. PHILOSOPHY, PSYCHOLOGY, AND EDUCATION.

Minimum requirement for all degrees 8* hours.

GROUP VI. ART AND ARCHITECTURE.

Minimum requirement for all degrees 2 hours.

GROUP VII. MILITARY SCIENCE.

Minimum requirement for all degrees 12 hours equated as 4.

The minimum requirement in each group may in general be satisfied in the freshman and sophomore years, but one

* In the case of honor students, 2 hours only, subject to the approval of the Dean.

elective must be taken in Group V in either the junior or the senior year by all except honor students; cf. also 3 below, and the outline of courses.

The various degrees will be conferred according to the following principles:

1 For the A.B. degree, the language requirement includes Greek I and Latin I, and also Beginner's Greek for students entering without Greek.

2 For the Litt.B. degree no specific requirement is made except the fulfilment of the minimum in each group of courses.

3 Candidates for the B.Sc. degree will take their majors in mathematics or natural science.

4 Candidates in the liberal courses must complete 136 term hours, except that honor students will be graduated with 124 term hours (in each case exclusive of essays and forensics).

SCHEDULE OF STUDIES FOR ALL THE LIBERAL COURSES

Freshman Year

		<i>Hours</i>
	English.....	4
	Mathematics.....	4
	Military Science.....	3 = 1
	Hygiene.....	1
<i>Two to be chosen</i>	{ Latin.....	4
	{ Greek.....	4
	{ (or Beginner's Greek).....	5
	{ German.....	4
	{ Chemistry.....	4

Sophomore Year		Hours
Civics.....		2
Military Science.....		3=1
Latin.....		3
Greek.....		3
French.....		3
German.....		3
English.....		3
<i>Five to be chosen</i> Mathematics.....		3
Chemistry.....		3
Physics.....		3
Botany.....		3
Zoology.....		3
History.....		3
Junior Year		
Ethics and Religion.....		2=1
Elective.....		15 or 18
Senior Year		
History of Art.....		2=1
Elective.....		15 or 18

RULES REGARDING ELECTIVES

1 Junior and senior courses are arranged in majors and minors.

(a) A major requires six hours weekly for two years. It may consist of two courses in one subject, or of two parallel courses in closely related subjects, as arranged by the department concerned.

(b) A minor consists of one three-hour course running through one year.

2 Majors are offered in English, Latin, Greek, German, the Romance languages, physics, chemistry, zoology and physiology, botany and plant physiology, mathematics, history, and political science.

3 At the beginning of the junior year every student shall choose one major to run through two years, and two minors, properly related to the major and to each other, to run for one year.

4 At the beginning of the senior year every student shall again choose two minors, properly related to the major and to each other.

5 In addition to the major and minors chosen, each student (excepting honor students) shall, at the beginning of both the junior and the senior year, choose one elective course, and he may choose two such courses, if his scholarship standing is satisfactory.

6 For honor students the choice of any elective courses in addition to the one major and the two minors is optional.

7 The choice of the major, and the minors taken in relation to the major, is subject to the approval of the department offering the major course.

8 All elective choices are subject to the limitations of the schedule and to the approval of the Dean, and no course may be chosen for which the student has not had the prescribed antecedent courses.

SCHEDULE OF STUDIES FOR THE TECHNICAL SCIENCE COURSES

Freshman Year

Engineering

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
English.....	3	English.....	3
Mathematics.....	5	Mathematics.....	5
German.....	4	German.....	4
Chemistry.....	3	Chemistry.....	3
Draughting.....	5 = 2	Draughting.....	5 = 2
Military Science.....	3 = 1	Military Science.....	3 = 1
Hygiene.....	1		
			18

Chemistry and Commerce

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
English	3	English	3
Mathematics	5	Mathematics	5
German	4	German	4
Chemistry	4	Chemistry	4
Draughting	3 = 1	Draughting	3 = 1
Military Science	3 = 1	Military Science	3 = 1
Hygiene	1		
	—		18
	14		

Agriculture and Biology

English	3	English	3
Mathematics	4	Mathematics	4
German	4	German	4
Chemistry	4	Chemistry	4
Draughting	3 = 1	Draughting	3 = 1
Military Science	3 = 1	Military Science	3 = 1
Hygiene	1	Hygiene	1
	—		18
	18		

Sophomore Year

Civics	2
French or German	3
Physics	3 or 4
Military Science	3 = 1
Departmental	9 or 8
	18

Junior Year

<i>All departments</i> < Departmental	15
Elective	3
	18

Senior Year

Departmental	15
Elective	3
	18

The technical courses are differentiated from the beginning of the freshman year as shown in the schedule.

A free elective in the junior and senior years permits all students to choose the advanced course in military science and tactics, to be offered as an elective course, or any other three-hour elective among the general courses offered, subject to regular approval.

Class honors will be awarded as in the liberal courses, and juniors and seniors in the honor group, while allowed to take an elective course in addition to the departmental work, will not be required to do so.

ENGLISH ESSAYS

During the freshman and sophomore years each student shall prepare one essay during each term on a subject selected under the direction of the department of English. In the junior year and in the first term of the senior year, each student shall make at least one written report of not less than 1,200 words on some subject connected with his elective major, or with the technical department chosen. This, after acceptance by the head of the department concerned, shall be submitted to the department of English to be graded as an exercise in English composition. In the second term of the senior year no essays are required except the graduation thesis, which in the liberal courses will be prepared under the direction of the professor in charge of the elective major, and in the technical courses under the direction of the head of the department.

COURSES OF STUDY*

THREE liberal courses lead to the degrees of

Bachelor of Arts (A.B.)
Bachelor of Letters (Litt.B.)
Bachelor of Science (B.Sc.)

Seven technical courses lead to the degree of

Bachelor of Science (B.Sc.)

In Agriculture	In Civil Engineering
In Biology	In Electrical Engineering
In Ceramics	In Mechanical Engineering
In Chemistry	

Each of these courses occupies four years, the year consisting of two terms.

Graduate courses lead to the master's or the doctor's degree.

LIBERAL COURSES

The Bachelor of Arts, the Bachelor of Letters, and the general Bachelor of Science courses are intended to meet the requirements of a liberal education as a preparation for the duties of citizenship and to lay a broad foundation for the pursuit of advanced studies, whether literary, scientific, or technical. They are also designed to furnish a broad preliminary training for the professions of law, medicine, theology, teaching, and journalism.

* The courses of study here described and the subsequent outlines exhibit the curriculum of the present year, to be modified in 1917-1918 in full accordance with the principles of revision laid down by the foregoing chapter.

In general character these courses are much alike. A certain amount of work in subjects of a literary, philosophic, and scientific character is required in all, both on account of their cultural value and as desirable preliminaries of all higher study whatever career or profession may be chosen. The Bachelor of Arts course includes both Latin and Greek, in the Bachelor of Letters course a modern language replaces Greek, and in the general Bachelor of Science course both Greek and Latin give place to work in modern languages and science.

Except for the limitations imposed by these differences the same broad range of electives is offered in all three and the courses are essentially parallel. The elective studies become increasingly important as the student advances and may be so chosen as either to extend further his training in the higher branches of learning or to fit him more particularly for the pursuit of some special vocation.

TECHNICAL COURSES

The technical Bachelor of Science courses are differentiated from the three more general courses described above chiefly by a more exhaustive pursuit of scientific study and a wider range of laboratory work coupled with restricted opportunities in other departments. The prescribed studies are designed to furnish a suitable basis for the pursuit of the more specialized studies in the elective groups. These embrace not only the special branches indicated by their names (agriculture, biology, ceramics, chemistry, civil engineering, electrical engineering, and mechanical engineering) but also other subjects which aid in training intelligent men, whatever their occupation, for the wise and useful discharge of the duties of citizenship. More extended descriptions of each of these courses will be found in connection with its schedule of studies, commencing at page 69.

GRADUATE COURSES

Courses for graduate students are offered in several departments, as exhibited by the tabulation on page 88. The work of the graduate student is of an advanced nature, consisting in great part of original research in his chosen field. These courses may lead to higher degrees (see pages 187-190). A number of fellowships have been provided which are described on pages 196-200.

SHORT COURSES

There are also several short courses, essentially practical in character, which do not lead to a degree—one in clay-working of two years and five in agriculture of twelve weeks each. The former, known as the short course in Clay-working, is arranged especially for the benefit of clay-workers who desire to perfect themselves in their craft but who are unable to take the full course of four years. The latter, known as the short courses in Agriculture, are planned to fit men, capable in other respects, to take charge of farms, dairies, and orchards.

SUMMER SESSION

The Summer Session, established by the State of New Jersey in 1913, furnishes an extensive series of courses for teachers and college students. Teachers are afforded opportunity to pursue studies in the theory and practice of education and psychology. Intensive courses are offered in the various school subjects and special provision is made for the preparation of teachers in agriculture, manual training, household arts, drawing, science, and mathematics. In addition regular collegiate courses of standard value are given. Credit for such work is extended by Rutgers College upon the hour for hour basis.

The very rapid growth of the Summer Session has brought demands for further enlargement of the scope of work. The purpose is to provide a wide program of liberal and scientific courses designed not only to meet certificate requirements but also to give teachers an opportunity to take advanced professional work and to pursue courses of college or graduate character.

The program of studies offered in the Summer Session has been approved by the State Board of Examiners and courses satisfactorily completed are accepted by this Board in lieu of examination in subjects required for State certificates.

EXTENSION WORK

The college offers extension courses at the college and at extramural centers where sufficient demand for them appears. These are regular college courses and may be counted in partial fulfilment of the requirements for the bachelor's degree. Under an arrangement recently approved by the State Department of Public Instruction, appropriate courses also earn credit for State teacher's certificates. The college is prepared to offer courses in English, education, psychology, and modern languages. In order to have a course offered at any center ten or more persons must register for it. The fees are those usually charged for courses of such character.

Agricultural extension work is conducted under the Smith-Lever Act of the United States Congress. Information in regard to this may be obtained from the department of agricultural extension. Lectures on various subjects by professors from the other departments of the college are also given in schools and communities desiring them.

Information concerning these lectures, the extramural

courses, or the collegiate extension courses may be obtained by addressing the Chairman of the Committee on Extension Work.

**BACHELOR OF ARTS, BACHELOR OF LETTERS, AND
GENERAL BACHELOR OF SCIENCE COURSES**

The studies of the freshman year, most of those of the sophomore year, and certain studies of the junior and senior years are prescribed for all candidates for the degrees of Bachelor of Arts, Bachelor of Letters, and Bachelor of Science.

Students entering with the requirements of the course leading to the degree of Bachelor of Letters may substitute beginner's Greek for the modern language of the freshman year and take regular freshman Greek in the sophomore year. In this case the degree of Bachelor of Arts will be conferred on completion of the course.

Students pursuing the general Bachelor of Science course who choose more than half their elective work in language, history, political science, ethics, pedagogy, or philosophy, will receive at graduation the degree of Bachelor of Letters.

Students in the general Bachelor of Science course who so desire may be transferred at the close of the freshman year to the technical Bachelor of Science course in Agriculture or in Biology.

One essay is required in each term of the freshman, sophomore, and junior years, and in the first term of the senior year.

One hour a week in the freshman year and six exercises each term during the remainder of the course are devoted to public speaking.

Electives

Before choosing his electives the student must consult the professors concerned, and the studies selected must be reported to the Registrar in writing. All choices are subject to the permission of the Faculty and the limitations of the schedule, and will be allowed only when the previous preparation of the student qualifies him for the work chosen.

Sophomore Electives.—Students in the Bachelor of Arts and Bachelor of Letters courses may elect any two of the three-hour sophomore courses in English, Latin, Greek (A B. course), German (Litt.B. course), and mathematics, in continuation of studies pursued during the freshman year; but those who have taken beginner's Greek in the freshman year must continue with regular freshman Greek in the sophomore year.

Students in the general Bachelor of Science course may take any two of the three-hour sophomore courses in English, German, mathematics, botany or zoology.

At the end of the freshman year each student in the Bachelor of Arts course must also notify the Registrar of his choice of German or French.

For transfer from the Technical Science courses to the General Science course, see page 68.

Junior and Senior Electives.—At the end of the sophomore year each student selects three of the three-hour electives in the following list and these are pursued throughout the junior year.

Two of the junior electives must be continued as four-hour courses through the senior year but the third may be changed for any other subject in the list below, subject only to the general regulations governing all elective studies. Hebrew may be taken as an extra elective during the senior year only when satisfactory standing is maintained in the other studies.

The following elective courses are offered in the junior and senior years, as indicated:

	<i>Hours per week</i>	
	Junior Year	Senior Year
Architecture.....	3	4
Astronomy.....	—	4
{ Bacteriology (Junior year, 1st term).....	3	—
{ Anatomy (Junior year, 2d term).....	3	4
{ Bacteriology (Junior year, 1st term).....	3	—
{ Entomology (Junior year, 2d term).....	3	4
Botany.....	3	4
Chemistry.....	3	4
Education.....	3	4
English.....	3	4
Ethics.....	—	4
French.....	3	4
Geology and Mineralogy.....	3	4
German.....	3	4
Greek.....	3	4
Hebrew (extra).....	—	2
History.....	3	4
Italian.....	3	4
Latin.....	3	4
Mathematics.....	3	4
Military Science.....	3	3
Philosophy.....	3	4
Physics.....	3	4
Political Science.....	3	4
Spanish.....	3	4
{ Zoology.....	3	—
{ Physiology.....	—	4

These courses are more fully set forth on page 64, with numbers referring to the descriptions, beginning on page 92.

BACHELOR OF ARTS COURSE**Freshman Year**

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
English 153, 155.....	4	English 154, 156.....	4
Latin 91-93.....	4	Latin 94-96.....	4
Greek 123.....	4	Greek 124.....	4
(Greek 121.....5)		(Greek 122.....5)	
Mathematics 241.....	4	Mathematics 243, 244.....	4
Hygiene 621.....	1	Hygiene 622.....	1
Military Science 601.....	3 = 1*	Military Science 601.....	3 = 1*

Sophomore Year

European History 51.....	4	European History 52.....	4
French 181, or German 217....	3	French 182, or German 218....	3
Physics 281.....	2	Physics 282.....	2
Laboratory 285.....	3 = 1	Laboratory 286.....	3 = 1
Elective (See next page).....	6	Elective (See next page).....	6
Physical Training 611.....	4 = 2	Physical Training 612.....	4 = 2
(or Military Science 601.....)	3 = 1)	(or Military Science 601.....)	3 = 1)

Junior Year

Ethics 1, 3, 5.....	3	Ethics 2, 4, 6.....	3
Logic 11.....	3	Psychology 12.....	3
Elective (See next page).....	12	Elective (See next page).....	12

Senior Year

Economics 73.....	3	Constitutional Law 75.....	4
International Law 77.....	1	History of Art 42.....	2 = 1
History of Art 41.....	2 = 1	Elective (See next page).....	12
Elective (See next page).....	12	Graduation Thesis 631	

* The expression 3 = 1 means that the three hours in military science are counted as two recitation hours; and in general, in work not requiring preparation, from two to three hours are tabulated as equivalent to one, according to the nature of the work.

ELECTIVE STUDIES**Sophomore Electives**

<i>Both Terms</i>	<i>Hours</i>	<i>Both Terms</i>	<i>Hours</i>
English 158, 159.....	3	Latin 97-100.....	3
Greek 126, 127 (123, 124*).....	3	Mathematics 245, 246.....	3

Junior Electives

Architecture 43, 44.....	3	French 181, 182 (183-188).....	3
Bacteriology 470, Anatomy 544.....	2	Geology 426-7-8-9 (421, 424).....	3
Laboratory 470, 544.....	3 = 1	German 217-8 (221-2 or 223-4).....	3
Bacteriology 470, Entomology, 581.....	2	Greek 129, 131.....	3
Laboratory 470, 581.....	3 = 1	History 55, 56.....	3
Botany 561, 563.....	2	Italian 191, 192.....	3
Laboratory 561, 563.....	3 = 1	Latin 101-106.....	3
Chemistry 397, 398.....	1	Mathematics 248, 249.....	3
Laboratory 397, 398.....	5 = 2	Military Science 602.....	5 or 6 = 3
Chemistry 391, 392.....	2 = 1	Philosophy 13, 14.....	3
Recitation 391, 392.....	1	Physics 287, 288.....	3
Laboratory 391, 392.....	3 = 1	Political Science 71, 72.....	3
Education 31, 32.....	3	Spanish 195, 196.....	3
English 161, 162 (163, 164).....	3	Zoology 541, 542 (543, 544).....	2
		Laboratory 541, 542 (543, 544).....	3 = 1

Senior Electives

Architecture 45, 46.....	2	Geology 421-4 (5)-30-1 (423-4 (5)-8-9; 421-4-8-9).....	4
Drawing 45, 46.....	5 = 2	German 225, 226.....	4
Anatomy 545, 546.....	2	Greek 132, 133.....	4
Laboratory 545, 546.....	5 = 2	Hebrew (extra) 141, 142.....	2
Astronomy 271, 272.....	4	History 57, 58 (59).....	4
Botany 562, 564.....	2	Italian 193, 194.....	4
Laboratory 562, 564.....	5 = 2	Latin 107-112.....	4
Chemistry 397, 398.....	2	Mathematics 256, 257.....	4
Laboratory 397, 398.....	5 = 2	Military Science 603.....	5 or 6 = 3
Chemistry 399, 400.....	1	Philosophy 15-18.....	4
Laboratory 399, 400.....	8 = 3	Physics 289, 290.....	4
Education 33, 34 (35, 38).....	4	Physiology 533, 534.....	2
English 165, 166.....	4	Laboratory 533, 534.....	5 = 2
Entomology 586, 583.....	2	Political Science 74, 76.....	4
Laboratory 586, 583.....	5 = 2	Spanish 197, 198.....	4
Ethics 7, 8.....	4		
French 183, 184 (187-190).....	4		

* Greek 123 and 124 are prescribed for students who have not taken these courses in the freshman year.

BACHELOR OF LETTERS COURSE**Freshman Year**

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
English 153, 155.....	4	English 154, 156.....	4
Latin 91-93.....	4	Latin 94-96.....	4
German 211 (215).....	4	German 212 (216).....	4
Mathematics 241.....	4	Mathematics 243, 244.....	4
Hygiene 621.....	1	Hygiene 622.....	1
Military Science 601.....	3 = 1	Military Science 601.....	3 = 1

Sophomore Year

European History 51.....	4	European History 52.....	4
French 181 (185).....	3	French 182 (186).....	3
Physics 281.....	2	Physics 282.....	2
Laboratory 285.....	3 = 1	Laboratory 286.....	3 = 1
Elective (See page 64)*.....	6	Elective (See page 64).....	6
Physical Training 611.....	4 = 2	Physical Training 612.....	4 = 2
(or Military Science 601.....)	3 = 1	(or Military Science 601.....)	3 = 1

Junior Year

Ethics 1, 3, 5.....	3	Ethics 2, 4, 6.....	3
Logic 11.....	3	Psychology 12.....	3
Elective (See page 64).....	12	Elective (See page 64).....	12

Senior Year

Economics 73.....	3	Constitutional Law 75.....	4
International Law 77.....	1	History of Art 42.....	2 = 1
History of Art 41.....	2 = 1	Elective (See page 64).....	12
Elective (See page 64).....	12	Graduation Thesis 631	

* All elective studies enumerated on page 64, excepting Greek, are offered to students in this course and in addition a German elective (219-222) is offered in the sophomore year.

GENERAL BACHELOR OF SCIENCE COURSE

Freshman Year

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
English 153, 155.....	4	English 154, 156.....	4
German 211 (215).....	4	German 212 (216).....	4
Mathematics 241.....	4	Mathematics 243, 244.....	4
Chemistry 391.....	1	Chemistry 392.....	1
Lectures 391.....	2=1	Lectures 392.....	2=1
Laboratory 391.....	5=2	Laboratory 392.....	5=2
Hygiene 621.....	1	Hygiene 622.....	1
Military Science 601.....	3=1	Military Science 601.....	3=1

Sophomore Year

European History 51.....	4	European History 52.....	4
French 181 (183-5).....	3	French 182 (184-6).....	3
Physics 281.....	2	Physics 282.....	2
Laboratory 283.....	5=2	Laboratory 284.....	5=2
Elective (See page 64)*.....	6	Elective (See page 64).....	6
Military Science 601.....	3=1	Military Science 601.....	3=1

Junior Year

Ethics 1, 3, 5.....	3	Ethics 2, 4, 6.....	3
Logic 11.....	3	Psychology 12.....	3
Elective (See page 64).....	12	Elective (See page 64).....	12

Senior Year

Economics 73.....	3	Constitutional Law 75.....	4
International Law 77.....	1	History of Art 42.....	2=1
History of Art 41.....	2=1	Elective (See page 64).....	12
Elective (See page 64).....	12	Graduation Thesis 631	

* All elective studies enumerated on page 64, excepting Greek and Latin, are offered to students in this course and in addition a German elective (courses 219-222) and a science elective (541-2 or 561, 563—see page 61) are offered in the sophomore year. For transfer to other courses see page 60.

TECHNICAL BACHELOR OF SCIENCE COURSES

The studies of the freshman year, a part of those of the sophomore year, and a few studies of the junior and senior years are the same for all students pursuing these courses.

One essay is required in each term of the freshman, sophomore, and junior years, and in the first term of the senior year.

One hour a week in the freshman year, six exercises each term in the sophomore year, and two each term during the remainder of the course are devoted to public speaking.

The technical courses begin to diverge at the beginning of the sophomore year, the specialization increasing each year thereafter. The course and not the individual subject is chosen and transfers from one course to another are allowed only by permission of the Faculty and on condition that all omitted work be made up.

Options and Electives

At the end of the freshman year each student in the technical Bachelor of Science courses must consult the head of the particular course which he intends to pursue.

At the end of the freshman year each student shall also notify the Registrar (1) of his choice of one of the technical courses or of his desire to be transferred to the general Bachelor of Science course, as explained on the following page, and (2) of his choice between French and German, if he falls in the class of students that have this option (see rule 3, below).

Modern language rules and options.—The following regulations govern the choice of German or French in the sophomore year:

- 1 Students who have offered no German for entrance will take German.

2 Students who have offered German and no French for entrance will take French.

3 Students who have offered both German and French for entrance will choose, subject to approval, either German or French.

Senior options.—The groups of options in the Course in Agriculture are described in connection with that course, on pages 70–73.

Transfer to the General Science Course.—Only students who have completed the freshman year of the technical science courses may be transferred to the general science course. These will take history 51–2, physics 281–2, 283–4, French 181–2 (183–4–5–6), and military science 601, with the general science students, in addition to one of the groups below. •

Group 1 Mathematics 251, 253 (4 hours); English 157, 160 (2 hours)

Group 2 Zoology 541, 542 (2 hours); Botany 561; 563 (3 hours); English 157, 160 (2 hours)

Group 3 English 158, 159 (3 hours); German 219, 220 (3 hours)

At the close of the sophomore year students thus transferred become regularly enrolled in the general science course with the same elective privileges as others. (See pages 61, 62.)

TECHNICAL BACHELOR OF SCIENCE COURSES**Freshman Year**

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
English 153, 155.....	3	English 154, 156.....	3
German 211 (213-15).....	4	German 212 (214-16).....	4
Algebra and Trigonometry 242	5	Analytic Geometry 247.....	5
Chemistry 391.....	1	Chemistry 392.....	1
Lectures 391.....	2 = 1	Lectures 392.....	2 = 1
Laboratory 391.....	3 = 1	Laboratory 392.....	3 = 1
Drafting 381.....	5 = 2	Drafting 382.....	5 = 2
Hygiene 621.....	1	Military Science 601.....	3 = 1
Military Science 601.....	3 = 1		

At the close of the freshman year, during which all students in the technical science courses pursue the same studies, the student may choose one of the seven technical courses, described on the following pages, or may be transferred to the general science course, as explained on page 68. In any case the student will consult with the professors concerned and give notice of his choice to the Registrar. (See page 67.)

COURSE IN AGRICULTURE

(For short courses in agriculture see pages 90, 91, 170.)

The four-year course in agriculture is designed to give a broad education and a thorough training in those branches of natural science which are the basis of scientific agriculture. A certain amount of practical work is prescribed and the students are expected to acquire through their contact with the soil, the plant, and the animal, in the various laboratories and at the College Farm, such a knowledge of agricultural technique as will help to make them efficient practical farmers, teachers, and investigators.

The fundamental subjects especially emphasized are

chemistry, physics, zoology, botany, bacteriology, and entomology. The general study of these subjects is supplemented in the sophomore, junior, and senior years by special laboratory, field, and classroom work in horticulture, plant propagation, plant pathology, animal husbandry, dairying, soils, fertilizers, agronomy, poultry husbandry, and farm management. The relations of chemistry, physics, and biology to soils and their fertility and maintenance are clearly pointed out; also the need for, and the influence of, manures, fertilizers, and soil amendments. The relations of botany, biology, and chemistry in the selection and rotation of crops, in the composition of animal and human foods and manufactured farm and dairy products, and in the economic development of the farm, are made a prominent part of the instruction in these branches.

The selection, development, improvement, and care of the live-stock of the farm and a study of the interdependence of animal husbandry and crop growing are an important part of the practical work required in the various laboratories.

The elective work of the senior year is so arranged as to offer the students a fairly wide range in the choice of subjects. Those who wish to prepare themselves for life on the farm are given an opportunity to specialize in the so-called practical subjects, including dairying, poultry keeping, farm crops, fruit growing, market gardening, and farm management. On the other hand, those who expect to become teachers and investigators are encouraged to specialize in botany and plant pathology, agricultural bacteriology, soil fertility, chemistry, entomology, and other subjects dealing with agriculture primarily as a science rather than as an art.

The agricultural subjects of the senior year are divided into optional groups, as shown in the following table. Each student chooses one of these groups:

Senior Optional Groups

<i>Group</i>	<i>Major Subject</i>		<i>Minor Subject</i>
I	Pomology	with	Entomology Plant Pathology
II	Pomology	with	Market Gardening Crops and Farm Management
III	Market Gardening	with	Entomology Plant Pathology
IV	Market Gardening	with	Entomology Crops and Farm Management
V	Poultry Husbandry	with	Animal Husbandry Crops and Farm Management
VI	Poultry Husbandry	with	Animal Breeding Poultry Pathology
VII	Dairy Husbandry	with	Animal Husbandry Crops and Farm Management
VIII	Dairy Husbandry	with	Animal Breeding Crops and Farm Management
IX	Entomology	with	Bacteriology Plant Pathology
X	Soil Fertility	with	Microbiology Geology
XI	Soil Fertility	with	{ Educational Psychology Principles of Education Agricultural Education
XII	Poultry Husbandry	with	{ Educational Psychology Principles of Education Agricultural Education
XIII	Dairy Husbandry	with	{ Educational Psychology Principles of Education Agricultural Education

Other options may be allowed upon consultation with the professors concerned.

The application of at least three students is necessary to justify the offering of an optional. Assignments to courses for a smaller number of students may be made upon the recommendation of the professors involved, subject to the approval of the Dean.

The courses in the foregoing groups, with their numbers and hours a week, are as follows:

Major Subjects

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
Pomology 495, 497	3	Pomology 498, 499, 500	4
Laboratory 495, 496	8 = 3	Laboratory 498, 500	5 = 2
Market Gardening 501	3	Market Gardening 502	3
Laboratory 501	8 = 3	Laboratory 502	8 = 3
Poultry Husbandry 489	3	Poultry Husbandry 490	3
Laboratory 489	8 = 3	Laboratory 490	8 = 3
Dairy Husbandry 483, 484	3	Dairy Husbandry 485, 486, 487	4
Laboratory 483, 484	8 = 3	Laboratory 485, 486	5 = 2
Soil Fertility 468, 471	3	Soil Fertility 469, 472	3
Laboratory 468	8 = 3	Laboratory 469	8 = 3
Entomology 582	3	Entomology 583	3
Laboratory 582	8 = 3	Laboratory 583	8 = 3

Minor Subjects

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
Plant Pathology 566.....	2	Plant Pathology 567.....	2
Laboratory 566.....	3 = 1	Laboratory 567.....	3 = 1
Crops 464.....	2	Farm Management 465.....	2
Laboratory 464.....	3 = 1	Laboratory 465.....	3 = 1
Bacteriology 473.....	2	Bacteriology 474.....	2
Laboratory 473.....	3 = 1	Laboratory 474.....	3 = 1
Microbiology 475.....	2	Microbiology 476.....	2
Laboratory 473.....	3 = 1	Laboratory 476.....	3 = 1
Animal Husbandry 478, 479..	2	Animal Husbandry 480, 481..	2
Laboratory 479.....	3 = 1	Laboratory 481.....	3 = 1
Geology 432.....	2	Geology 433.....	2
Laboratory 432.....	3 = 1	Laboratory 433.....	3 = 1
Entomology 584.....	2	Entomology 585.....	2
Laboratory 584.....	3 = 1	Laboratory 585.....	3 = 1
Market Gardening 503.....	2	Market Gardening 504.....	2
Laboratory 503.....	3 = 1	Laboratory 504.....	3 = 1
Poultry Pathology 491.....	2	Poultry Pathology 492.....	2
Laboratory 491.....	3 = 1	Laboratory 492.....	3 = 1
Animal Breeding 547.....	2	Animal Breeding 548.....	2
Laboratory 547.....	3 = 1	Laboratory 548.....	3 = 1
{ Educational Psychology 33	3	Agricultural Education and	
{ Principles of Education 35..	3	Thesis 36, 37.....	10

COURSE IN AGRICULTURE

(FOR FRESHMAN YEAR SEE PAGE 69.)

Sophomore Year

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
American Literature 157.....	2	English Literature 160.....	2
French 181 (183-5), or		French 182 (184-6), or	
German 219 (221).....	3	German 220 (222).....	3
Physics 281.....	2	Physics 282.....	2
Laboratory 285.....	3=1	Laboratory 286.....	3=1
Qualitative Analysis 395.....	2	Agronomy 463.....	2
Laboratory 395.....	5=2	Laboratory 463.....	3=1
Soils 461.....	2	Dairy Husbandry 482.....	1
Laboratory 461.....	3=1	Laboratory 482.....	3=1
Botany 561.....	2	Poultry Husbandry 488.....	1
Laboratory 561.....	3=1	Laboratory 488.....	3=1
Military Science 601.....	3=1	Plant Physiology 563.....	2
		Laboratory 563.....	3=1
		Military Science 601.....	3=1

Summer { Field practice in General Surveying 306.... 50 hours
 { Field practice in Soil Surveying 462..... 50 "

Junior Year

Quantitative Analysis 399.....	1	Fertilizers and Manures 467....	2
Laboratory 399.....	8=3	Animal Husbandry 477.....	2
Plant Propagation 493.....	2	Laboratory 477.....	3=1
Laboratory 493.....	3=1	Pomology 494.....	3
Bacteriology 470.....	2	Laboratory 494.....	3=1
Laboratory 470.....	3=1	Zoology 542.....	2
Zoology 541.....	1	Laboratory 542.....	3=1
Laboratory 541.....	3=1	Entomology 581.....	2
Plant Pathology 565.....	1	Laboratory 581.....	3=1
Laboratory 565.....	3=1	American History 54.....	3
European History 53.....	3	(or Military Science 602... 5 or 6=3)	
(or Military Science 602... 5 or 6=3)			

Senior Year

Optional (See preceding pages) 12	Optional (See preceding pages) 12
Graduation Thesis 505, 631....5 = 2	Graduation Thesis 506, 631....5 = 2
Economics 73 (3) and	Constitutional Law 75..... 4
International Law 77 (1)..... 4	(or Military Science 603...5 or 6 = 3)
(or Military Science 603...5 or 6 = 3)	

BIOLOGY**The Four-Year Course**

The technical part of this course is a comprehensive combination of chemical and biological sub-courses. Biochemistry (not offered in other courses) is here added to qualitative and quantitative analysis and organic chemistry. Basic courses in botany, zoology, bacteriology, and entomology give excellent preparation for teachers of natural science, and with the addition of fundamental courses in anatomy, histology, embryology, and physiology, afford a broad foundation for medical study and biological research.

Sanitary Science

The course in sanitary science, established in 1916, is affiliated with the course in biology. In the sophomore year the studies coincide with those of the biological course, except that plant physiology is replaced by limnology and that in the following summer 100 hours of surveying are prescribed. The junior and senior years include protozoology and helminthology, pathogenic bacteriology, epidemiology, pathology and suitable courses in the engineering school, particularly public water supply and sewerage. In addition, opportunity is given for practical work under the direction of the State Board of Health.

Elective Courses

Biological subjects are offered separately and in combination as electives. Specialization in either plant or animal study is thus facilitated for students who do not take the course in agriculture or in biology.

The College supports tables at the Brooklyn Institute Laboratory at Cold Spring Harbor, Long Island, and at the Woods Hole Marine Biological Laboratory, where students may take summer courses for undergraduate or graduate credit.

COURSE IN BIOLOGY

(FOR FRESHMAN YEAR SEE PAGE 69.)

Sophomore Year

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
American Literature 157.....	2	English Literature 160.....	2
French 181 (183-5), or		French 182 (184-6), or	
German 219 (221).....	3	German 220 (222).....	3
Physics 281.....	2	Physics 282.....	2
Laboratory 285.....	3=1	Laboratory 286.....	3=1
Qualitative Analysis 395.....	2	Qualitative Analysis 396.....	2
Laboratory 395.....	5=2	Laboratory 396.....	5=2
Zoology 541.....	1	Zoology 542.....	1
Laboratory 541.....	3=1	Laboratory 542.....	3=1
Botany 561.....	2	Plant Physiology 563.....	2
Laboratory 561.....	3=1	Laboratory 563.....	3=1
Military Science 601.....	3=1	Military Science 601.....	3=1

Junior Year

Quantitative Analysis 399.....	1	Psychology 12.....	3
Laboratory 399.....	8=3	Entomology 581.....	2
Vertebrate Anatomy 543.....	1	Laboratory 581.....	3=1
Laboratory 543.....	5=2	Vertebrate Anatomy 544.....	2
Bacteriology 470.....	2	Laboratory 544.....	5=2
Laboratory 470.....	3=1	Physiology 532.....	3
Physiology 531.....	3	Laboratory 532.....	5=2
Laboratory 531.....	5=2	American History 54.....	3
European History 53.....	3	(or Military Science 602... 5 or 6=3)	
(or Military Science 602... 5 or 6=3)			

Senior Year

Organic Chemistry 407.....	1	Organic Chemistry 408.....	1
Lectures 407.....	2=1	Lectures 408.....	2=1
Laboratory 407.....	8=3	Laboratory 408.....	8=3
Biochemistry 533.....	3	Biochemistry 534.....	3
Laboratory 533.....	5=2	Laboratory 534.....	5=2
Histology 545.....	2	Embryology 546.....	2
Laboratory 545.....	5=2	Laboratory 546.....	5=2
Economics 73 (3) and		Graduation Thesis 631	
International Law 77 (1).....	4	Constitutional Law 75.....	4
(or Military Science 603... 5 or 6=3)		(or Military Science 603... 5 or 6=3)	

COURSE IN CERAMICS

The ceramic industries of to-day depend for their success upon the intelligent application of scientific principles. These scientific principles are taught in the following highly specialized course.

Since the processes and the problems of manufacturing are of a chemical engineering nature the course is arranged to familiarize the student thoroughly with the principles of chemistry supplemented by a considerable amount of engineering theory—both subjects as applied to clay-working operations.

The technical training consists of lecture and laboratory courses, and includes such fundamental subjects as general and analytical chemistry, physics, geology, mineralogy, and crystallography. The purely ceramic studies deal with the chemical and the mechanical operations of the industry in all its phases—mining of the raw material, manufacturing of wares, the faults and the difficulties, the laws of drying and firing, and kilns and driers. The engineering subjects taught are drafting, surveying, elements of steam engineering, elements of electrical engineering, machine design, and strength of materials.

The student demonstrates in the laboratory the principles he has been taught. The laboratory course is a practical one, made possible by the extensive mechanical equipment, affording opportunity for the reproduction of all the ordinary processes of clay-working. As a further help visits are made from time to time to near-by factories engaged in clay-working operations.

The short course in clay-working is described on page 89.

COURSE IN CERAMICS

(FOR FRESHMAN YEAR SEE PAGE 69.)

Sophomore Year

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
American Literature 157.....	2	English Literature 160.....	2
French 181 (183-5), or		French 182 (184-6), or	
German 219 (221).....	3	German 220 (222).....	3
Calculus 250.....	3	Calculus 252.....	3
Physics 281.....	2	Physics 282.....	2
Laboratory 285.....	3=1	Laboratory 286.....	3=1
Qualitative Analysis 393.....	2	Qualitative Analysis 394.....	2
Laboratory 393.....	10=4	Laboratory 394.....	10=4
Military Science 601.....	3=1	Military Science 601.....	3=1

Summer: Field practice in Surveying 306..... 100 hours

Junior Year

Crystallography 426.....	1	Mineralogy 427.....	1
Laboratory 426.....	3=1	Laboratory 427.....	3=1
Electrical Engineering 331.....	3	Steam Engineering 376.....	1
Steam Boilers and Engines 370	3	Laboratory 376.....	3=1
Quantitative Analysis 399.....	1	Quantitative Analysis 400.....	1
Laboratory 399.....	8=3	Laboratory 400.....	8=3
Origin and Nature of Clays 441.	3	Winning and Preparation of	
European History 53:.....	3	Clays 442.....	3
(or Military Science 602..5 or 6=3)		Ceramic Calculations 443.....	3
		Ceramic Laboratory 444.....	3=1
		American History 54.....	3
		(or Military Science 602..5 or 6=3)	

Senior Year

Geology 421.....	3	Machine Design 355.....	4=2
Machine Design 354.....	4=2	Strength of Materials 366.....	2
Bodies and Glazes 445.....	1	Thermochemical Calculations 448	3
Lectures 445.....	2=1	Driers and Kilns 449.....	3
Laboratory 445.....	10=4	Ceramic Laboratory 446.....	10=4
Thermochemical Calculations 447	3	Graduation Thesis 631	
Economics 73 (3) and		Constitutional Law 75.....	4
International Law 77 (1).....	4	(or Military Science 603..5 or 6=3)	
(or Military Science 603..5 or 6=3)			

COURSE IN CHEMISTRY

A student who pursues throughout the four years the courses laid down as required by the chemical department is qualified on graduation to enter at once the positions open to chemists in factories or technical and analytical laboratories or to pursue his scientific studies further on the lines of original research in laboratories of pure science.

Work in chemistry begins in the first year with a course in general chemistry, embracing both classroom and laboratory exercises. In the second year the student begins his study of analytical methods with qualitative analysis. Further study along the lines of analytical chemistry in quantitative analysis follows these courses in the third year and at the same time practical application of the chemical methods along industrial lines is begun.

In the fourth year organic, physical, advanced inorganic, and organic industrial chemistry are studied in both classroom and laboratory. At the beginning of the second term of the fourth year the student chooses some problem of special interest for intensive study and is required to search the technical literature and journals for full details on this subject and then carry out a scheme of laboratory work along the lines thus opened up for him. This gives him an opportunity to study the methods of practical chemists and to make direct application of his own studies throughout the four years of his work in the field of chemistry. At the end of the year his written report upon the work accomplished is turned in as part of his graduation requirements in the form of a thesis.

COURSE IN CHEMISTRY

(FOR FRESHMAN YEAR SEE PAGE 69.)

Sophomore Year

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
American Literature 157.....	2	English Literature 160.....	2
French 181 (183-5), or		French 182 (184-6), or	
German 219 (221).....	3	German 220 (222).....	3
Calculus 250.....	3	Calculus 252.....	3
Physics 281.....	2	Physics 282.....	2
Laboratory 285.....	3=1	Laboratory 286.....	3=1
Qualitative Analysis 393.....	2	Qualitative Analysis 394.....	2
Laboratory 393.....	10=4	Laboratory 394.....	10=4
Military Science 601.....	3=1	Military Science 601.....	3=1

Junior Year

Industrial Chemistry 404.....	3	Industrial Chemistry 405.....	4
Quantitative Analysis 401.....	1	Quantitative Analysis 402.....	1
Lectures 401.....	2=1	Lectures 402.....	2=1
Laboratory 401.....	10=4	Laboratory 402.....	18=7
Bacteriology 470.....	2	Mineralogy 427.....	1
Laboratory 470.....	3=1	Laboratory 427.....	3=1
Crystallography 426.....	1	American History 54.....	3
Laboratory 426.....	3=1	(or Military Science 602..5 or 6=3)	
European History 53.....	3		
(or Military Science 602..5 or 6=3)			

Summer: Quantitative Analysis Laboratory 403..... 100 hours

Senior Year

Geology 421.....	3	Adv. Inorganic Chemistry 410	2
Adv. Inorganic Chemistry 409		Physical Chemistry 412.....	2
Lectures 409.....	2=1	Organic Chemistry 408.....	1
Laboratory 409.....	3=1	Lectures 408.....	2=1
Physical Chemistry 411.....	2	Laboratory 408.....	8=3
Organic Chemistry 407.....	1	Industrial Chemistry,	
Lectures 407.....	2=1	Organic 406.....	1
Laboratory 407.....	12=5	Lectures 406.....	2=1
Economics 73 (3) and		Graduation Thesis 413, 631...8=3	
International Law 77 (1).....	4	Constitutional Law 75.....	4
(or Military Science 603..5 or 6=3)		(or Military Science 603..5 or 6=3)	

COURSE IN CIVIL ENGINEERING

This course is designed to give the student a knowledge of the fundamental principles essential to the profession of civil engineering. It is recognized that an engineer must gain proficiency by practical experience and that a college course should aim to provide adequate mental training for engineering practice as well as a knowledge of its governing principles. To this end a thorough drill in mathematics is given both for its general educational value and for its importance as an essential tool for the educated engineer.

The subjects of a technical character embrace plane surveying in all its branches; railroad engineering; the materials of construction and their uses; the mechanics and strength of materials; the designing of bridges and other structures, including the determination of stresses in the members of such structures by both analytic and graphic methods; sanitary science as it applies more particularly to the supply of pure water to towns and the building of the necessary waterworks, the building of sewers, and the disposal of sewage; the making of pavements and roads; hydraulic engineering; geodesy. In addition to practice in surveying during term time, field practice in surveying and railroad location is given at the end of the college year when the whole time for two or more weeks is devoted to such work. Drafting is continued throughout the four years in connection with the subjects taught in the classroom. Laboratory practice in performing hydraulic experiments, in testing steel, cement, and other materials, and field work in precise surveying and leveling are required throughout the senior year.

COURSE IN CIVIL ENGINEERING

(FOR FRESHMAN YEAR SEE PAGE 69.)

Sophomore Year

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
American Literature 157.....	2	English Literature 160.....	2
French 181 (183-5), or		French 182 (184-6), or	
German 219 (221).....	3	German 220 (222).....	3
Calculus 251.....	4	Calculus 253.....	4
Physics 281.....	2	Physics 282.....	2
Laboratory 283.....	5=2	Laboratory 284.....	5=2
Descriptive Geometry 301.....	2	Surveying 302.....	2
Drawing 301.....	3=1	Field Practice 302.....	3=1
Machine Drawing 304.....	3=1	Topographical Drawing 305.....	3=1
Military Science 601.....	3=1	Military Science 601.....	3=1

Summer: Field practice in Surveying 306..... 100 hours**Junior Year**

Mechanics 254.....	4	Mechanics 255.....	2
Graphic Statics 307.....	3=1	Railway Engineering 308.....	2
Strength of Materials 309.....	4	Field Practice 308.....	3=1
Electrical Engineering 331.....	3	Theory of Structures 312.....	3
Steam Boilers and Engines 370	3	Hydraulics (3), Lab. (3=1), 313	4
European History 53.....	3	Materials Laboratory 315.....	3=1
(or Military Science 602..5 or 6=3)		Steam Engineering 376.....	1
		Laboratory 376.....	3=1
		American History 54.....	3
		(or Military Science 602..5 or 6=3)	

Summer: Railroad Surveying 311..... 100 hours**Senior Year**

Reinforced Concrete 314.....	3	Masonry Construction 310....	4=2
Cement Laboratory 314.....	3=1	Highway Engineering 318.....	2
Theory of Structures 316.....	2	Geodesy; Pract. Astronomy 319	3
Design 316.....	4=2	Field Practice 319.....	3=1
Public Water Supplies 317.....	2	Sewerage (2), Design (3=1), 321	3
Design 317.....	3=1	Bridge Design 322.....	3=1
Railroad Economics 320.....	2	Geology 422.....	1
Design 320.....	3=1	Lectures 422.....	2=1
Economics 73 (3) and		Graduation Thesis 631	
International Law 77 (1).....	4	Constitutional Law 75.....	4
(or Military Science 603..5 or 6=3)		(or Military Science 603..5 or 6=3)	

COURSE IN ELECTRICAL ENGINEERING

This course is designed to give the student a thorough training in those general and scientific subjects which are fundamental and in those technical subjects which will best fit him to enter upon the profession of electrical engineering.

The general subjects are for the most part studied in the first two years of the course, thus giving a proper foundation for the technical subjects involving the applications of electrical theory to dynamo-electric machinery, telegraphy, telephony, illuminating engineering, power transmission and distribution, and electric railways, all of which are taken up in the junior and senior years. Certain studies in the departments of civil and mechanical engineering which are of special importance to an electrical engineer, as, for example, steam engines and boilers, and power plant engineering, are included in the course. Great importance is attached to the study of the theory of electricity upon which all electrical engineering depends.

Visits to electric power plants and the works of the large electrical manufacturing companies are a very important feature of the course.

Laboratory instruction begins in the laboratories of chemistry and general physics. This is followed by work in electrical measurements and in the dynamo and steam-engineering laboratories, which includes the usual factory and commercial tests of the various types of direct current and single and polyphase alternating current generators and motors, rotary converters, transformers, and other electrical apparatus, and also steam engine tests. This work is planned to familiarize the student with the operation of electrical apparatus and to develop in him habits of careful observation. Accuracy in the results obtained is essential.

COURSE IN ELECTRICAL ENGINEERING

(FOR FRESHMAN YEAR SEE PAGE 69.)

Sophomore Year

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
American Literature 157.....	2	English Literature 160.....	2
French 181 (183-5), or		French 182 (184-6), or	
German 219 (221).....	3	German 220 (222).....	3
Calculus 251.....	4	Calculus 253.....	4
Physics 281.....	2	Physics 282.....	2
Laboratory 283.....	5 = 2	Laboratory 284.....	5 = 2
Machine Drawing 351.....	5 = 2	Surveying 303.....	2
Machine Elements 358.....	4 = 2	Machine Drawing 352.....	5 = 2
Military Science 601.....	3 = 1	Military Science 601.....	3 = 1

Summer: Field practice in Surveying 306..... 100 hours**Junior Year**

Mechanics 254.....	4	Mechanics 255.....	2
Elements of Direct		Elements of Alternating Cur-	
Current Engineering 331..	3	rents 335.....	5
Telephones and Telegraphs 332	2	Dynamo Laboratory 336.....	3 = 1
Theory of Electrical Measure-		Elements of Machine Design 353	3 = 1
ments 333.....	1	Mechanics of Materials 365....	4
Electrical Laboratory 334.....	5 = 2	Mechanical Instruments 374....	1
Steam Boilers and Engines 370	3	Laboratory 374.....	3 = 1
European History 53.....	3	American History 54.....	3
(or Military Science 602..	5 or 6 = 3)	(or Military Science 602..	5 or 6 = 3)

Summer { Dynamo Laboratory 337..... 50 hours
 { Mechanical Laboratory 375..... 50 "

Senior Year

Illuminating Engineering 338..	2	Advanced Alternating Currents	
Advanced Alternating Currents		340.....	4
339.....	4	Electric Traction 342.....	3
Electric Power Transmission 341	2	High Voltage Engineering 343..	2
Dynamo Laboratory 344.....	5 = 2	Dynamo Laboratory 345.....	5 = 2
Electrical Design 346.....	2 = 1	Electrical Design 347.....	2 = 1
Thermodynamics 371.....	3	Power Plant Engineering 373..	2
Economics 73 (3) and		Graduation Thesis 631	
International Law 77 (1).....	4	Constitutional Law 75.....	4
(or Military Science 603..	5 or 6 = 3)	(or Military Science 603..	5 or 6 = 3)

COURSE IN MECHANICAL ENGINEERING

The aim of the technical studies in this course is to give a thorough drill in the principles which underlie mechanical engineering and to prepare the graduate to acquire easily and rapidly the special skill and knowledge of detail belonging to the particular line of work which he may follow.

The elements of machine drawing are taught in the sophomore year, with some empirical machine design; but the principal work in design comes in the senior year, after the necessary theory has been presented and a better foundation of general knowledge established.

A descriptive knowledge of machine elements and of a few important machines is given in the sophomore year, after which description becomes an incidental part of many courses. From this beginning the study of machine construction turns to shop processes, work in the shop, machine tools and their operation, and the principles of shop design and operation.

Applied mechanics run through the junior and senior years, in the general subjects of mechanics of materials and hydraulics and in the mechanics of machinery which deals more particularly with motions and forces in machines.

A good grounding in the principles of electric power engineering is given in the junior year. Heat and power engineering is begun in the junior year and runs through the senior year, where the title thermodynamics covers not only the theory of the subject, but also its applications in steam and gas engines and in power plants.

Work in the mechanical laboratory, mainly along the lines of applied thermodynamics and measurement of power, with some applied mechanics, is intended to enforce the principles taught in the classroom and to give the student skill and confidence in using them.

COURSE IN MECHANICAL ENGINEERING

(FOR FRESHMAN YEAR SEE PAGE 69.)

Sophomore Year

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
American Literature 157.....	2	English Literature 160.....	2
French 181 (183-5), or		French 182 (184-6), or	
German 219 (221).....	3	German 220 (222).....	3
Calculus 251.....	4	Calculus 253.....	4
Physics 281.....	2	Physics 282.....	2
Laboratory 283.....	5=2	Laboratory 284.....	5=2
Machine Drawing 351.....	5=2	Machine Drawing 352.....	5=2
Machine Elements 358.....	4=2	Constructive Processes 359.....	5=2
Military Science 601.....	3=1	Military Science 601.....	3=1
<i>Summer:</i> Machine Construction 360..... 100 hours			

Junior Year

Mechanics 254.....	4	Mechanics 255.....	2
Elements of Direct		Elements of Alternating	
Current Engineering 331..	3	Current Engineering 335..	5
Machine Shop Methods 361...3=1		Dynamo Laboratory 336...3=1	
Mechanism and Kinematics 367	2	Materials and Tools 362.....2=1	
Drafting 367.....	5=2	Mechanics of Materials 365....	4
Steam Boilers and Engines 370	3	Mechanical Instruments 374...1	
European History 53.....	3	Laboratory 374.....	3=1
(or Military Science 602...5 or 6=3)		American History 54.....	3
		(or Military Science 602...5 or 6=3)	

Summer { Dynamo Laboratory 337..... 50 hours
 { Mechanical Laboratory 375..... 50 "

Senior Year

Hydraulics 323.....	3	Machine Design 357.....	6=3
Machine Design 356.....	6=3	Engineering Economics 364....2=1	
Shop Design 363.....	2=1	Kinematics and Dynamics 369	2
Graphics 368.....	1	Drafting 369.....	5=2
Drafting 368.....	5=2	Thermodynamics 372.....	3
Thermodynamics 371.....	3	Power Plant Engineering 373..	2
Mechanical Laboratory 377...3=1		Mechanical Laboratory 378...3=1	
Economics 73 (3) and		Graduation Thesis 631	
International Law 77 (1).....	4	Constitutional Law 75.....	4
(or Military Science 603...5 or 6=3)		(or Military Science 603...5 or 6=3)	

GRADUATE COURSES**In Agriculture**

Farm Crops.....	507	Research Thesis in Dairy Hus-	
Farm Management.....	508	bandry.....	515
Microbiology of Soils.....	509	Advanced Poultry Husbandry...	516
Soil Bacteriology.....	510	Pomology and Small Fruits.....	517
Soil Chemistry.....	511	Olericulture.....	518
Soil Fertility.....	512	Floriculture.....	519
Advanced Animal Husbandry...	513	Plant Physiology.....	520
Advanced Dairy Husbandry....	514	Plant Breeding.....	521

In Plant Pathology

Advanced Plant Pathology.....	568	Advanced Plant Pathology.....	570
Advanced Plant Pathology.....	569	Advanced Plant Pathology.....	571

In Entomology

Taxonomic Entomology.....	587
Economic Entomology.....	588
Morphology and Development.....	589

In Zoology

Research in Histology.....	549	Research in Embryology.....	550
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In Geology

Rocks and Soils.....	432	Rocks and Soils.....	433
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In Civil Engineering

Reinforced Concrete Construction.....	324
Sanitary, Hydraulic, and Irrigation Engineering.....	325

In Physiology

Research in Physiology.....	535	Research in Biochemistry.....	536
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In Education

Educational Administration....	38	Educational Measurements.....	39
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SHORT COURSE IN CLAY-WORKING

The two-year course is designed for young men who lack time or means to pursue the longer course described on page 78.

For those who have had practical experience in ceramic industries (see page 46) are provided courses that include special laboratory work in ceramics and all or a part of the ceramic and other subjects given in the short course.

First Year

<i>First Term</i>	<i>Hours</i>	<i>Second Term</i>	<i>Hours</i>
Physics 281.....	2	Physics 282.....	2
Laboratory 285.....	3=1	Laboratory 286.....	3=1
Origin and Nature of Clays		Winning and Preparation of	
441.....	3	Clays 442.....	3
Chemistry 391.....	2	Ceramic Calculations 443...	3
Laboratory 391.....	3=1	Chemistry 392.....	2
Physical Testing of Clays		Laboratory 392.....	3=1
Lectures 450.....	2=1	Physical Testing of Clays	
Laboratory 450.....	10=4	Lectures 451.....	2=1
Military Science* 601.....	3=1	Laboratory 451.....	8=3
		Military Science* 601.....	3=1

Second Year

Drafting 381.....	5=2	Geology 422.....	3
Qualitative Analysis 395....	2	Qualitative Analysis 396....	2
Laboratory 395.....	5=2	Laboratory 396.....	5=2
Bodies and Glazes 445.....	1	Ceramic Laboratory 446...12=5	
Lectures 445.....	2=1	Driers and Kilns 449.....	4
Laboratory 445.....	12=5	Design 449.....	5=2
Military Science* 602.....	3=1	Military Science* 602.....	3=1

* Practical clay-workers are exempt from the course in military science.

SHORT COURSES IN AGRICULTURE

The short courses in agriculture are planned to give assistance to those who desire to become better farmers, more skillful stockmen, dairymen, poultrymen, fruit growers, or market gardeners, but who are unable to take an extended course of study.

They give training in the best modern methods of managing farms, dairies, and orchards. The instruction in everything is practical with the special view of being immediately useful. Students are taught by practical demonstration how to manage soils, to use fertilizers, to judge farm stock, to manage poultry, to select varieties of farm crops, to propagate plants, to bud, graft, plant, and prune orchards, to handle and test milk and cream, to use cream separators, to make butter, and in general more intelligently to conduct farming operations.

Students coming for the first time are urged to select the course in general agriculture and dairy farming, as the work offered in that course is more general in its character and furnishes a good foundation for a study of special lines. One of the other short courses may then be taken more advantageously the second winter.

The four-year Course in Agriculture is described on pages 69-75.

SHORT COURSES IN AGRICULTURE

General and Dairy Farming

Soils and Fertilizers.....	701	Poultry Husbandry.....	708
Animal Production and Feeding.	702	Practical Fruit Growing.....	709
Animal Husbandry.....	703	Agricultural Engineering.....	710
Agronomy.....	704	Seed Testing and Identification	711
Dairy Manufactures.....	705	Farm Management.....	712
Dairy Production.....	706	Farm Machines.....	713
General Economic Entomology..	707		

Fruit Growing and Market Gardening

Soil Fertility.....	714	Vegetable Gardening.....	721
Principles of Plant Growth.....	715	Animal Husbandry.....	722
Principles of Pruning.....	716	Economic Entomology.....	723
Spraying of Orchards.....	717	Poultry Husbandry.....	724
Practical Fruit Growing.....	718	Woodshop and Forge Work....	725
Systematic Pomology.....	719	General Laboratory.....	726
Plant Diseases.....	720		

Poultry Husbandry

Types and Breeds of Poultry...	727	Turkeys, Geese, Ducks, and Pigeons.....	736
Poultry Breeding.....	728	Flock Practice.....	737
Exhibition, Scoring, and Judging	729	Animal Husbandry.....	738
Preparation and Marketing.....	730	Practical Fruit Growing.....	739
Location, Design, and Construc- tion of Buildings.....	731	Soil Fertility.....	740
Sanitation, Parasites, and Dis- eases.....	732	Woodshop and Forge Work....	741
Incubation and Brooding.....	733	Agronomy.....	742
Poultry Farm Management....	734	Vegetable Gardening.....	743
Principles and Practice of Poul- try Feeding.....	735	Trips.....	744

Home Economics

Chemistry of Foods.....	745	Sewing.....	751
Cooking Exercises.....	746	Millinery.....	752
Home Nursing.....	747	Principles of Laundry Practice..	753
Emergencies.....	748	Personal Hygiene.....	754
Home Sanitation.....	749	General Lectures.....	755
Home Management.....	750		

Bee Husbandry

Soils and Fertilizers.....	756	Economic Entomology.....	761
Animal Production and Feeding	757	Shop Practice.....	762
Agronomy.....	758	Honey Plants.....	763
Practical Fruit Growing.....	759	Honeys.....	764
Farm Management.....	760	Bee Husbandry.....	765

DESCRIPTIVE OUTLINES

THE textbooks and other works named in connection with these descriptions are intended in general to be merely representative and may be changed from year to year.

ETHICS AND EVIDENCES OF CHRISTIANITY

Acting Professor SCHENCK

1 *The English Bible*

Junior year, first term, 1 hour a week.

The literary study of the Bible,—its narrative, epic story, poetry, oratory, and letters.

Lectures, recitations, and books of reference (Moulton, Bowen, Ladd).

2 *The English Bible*

Junior year, second term, 1 hour a week.

A continuation of course 1.

3 *Christian Evidences*

Junior year, first term, 1 hour a week.

Textbook (Schenck's *Christian Evidences*) and books of reference (Fisher, Ward, Mullin).

4 *Christian Ethics*

Junior year, second term, 1 hour a week.

Textbook (Schenck's *Christian Ethics*) and books of reference (Janet, Myers, Elwood).

5 *Sociology*

Junior year, first term, 1 hour a week.

Lectures, recitations, and books of reference (Spencer, Giddings, Blackmore).

6 *Sociology*

Junior year, second term, 1 hour a week.

A continuation of course 5.

[Courses 7, 8 omitted 1916-1917]

7 *History of Ethics*

Senior year, first term, 4 hours a week.

The object of the course is the training of the mental powers and the acquiring of knowledge. The ethical teachings of the different philosophers are passed in review. The subject is studied in a threefold way—theoretically (McKenzie), historically (Myers), and practically (Elwood); also by lectures and readings.

8 *History of Ethics* (continued)

Senior year, second term, 4 hours a week.

LOGIC AND MENTAL PHILOSOPHY

Professor MARVIN

11 *Logic*

Junior year, first term, 3 hours a week.

The aim of this course is to give the student a knowledge of the principles of deductive inference and of their application to reasoning. (Jevon's *Elementary Lessons in Logic*)

The following course is begun before the end of the term.

12 *Elementary Course in Psychology*

Junior year, second term and part of the first term, 3 hours a week.

The purpose of this course is to describe and to explain the typical facts of human mental life. (Thorndike's *Elements of Psychology* and Thorndike's *Educational Psychology*)

13 *History of Philosophy*

Junior year, first term, 3 hours a week.

This course gives a general account of the development of European thought from the Greeks to modern times.

14 *History of Philosophy* (continued)

Junior year, second term, 3 hours a week.

15 *Advanced Course in Psychology*

Senior year, first term, 4 hours a week.

This course is a continuation of the elementary course in psychology and consists of a more extensive and detailed study of man's inborn mental nature, of man's learning process, and of his individual mental differences.

16 *Advanced Course in Psychology* (continued)

Senior year, second term, 4 hours a week.

17 *Elementary Course in Metaphysics*

Senior year, first term, 4 hours a week.

An elementary study of the principles of science and of the modern theories of reality. (Marvin's *A First Book in Metaphysics*)

18 *Elementary Course in Metaphysics* (continued)

Senior year, second term, 4 hours a week.

EDUCATION

Professor ELLIOTT, courses 33-35, 38, 39

Professor PAYSON, courses 31, 32

_____, courses 36, 37

NOTE.—Courses 31, 32, 33, 34 are pursued by all students electing education. All candidates for certificates to teach in secondary schools of New Jersey are required by the Department of Public Instruction

to possess a knowledge of the fields of history of education, educational psychology, and secondary education. Work satisfactorily completed in courses 31, 32, 33, 34 is accepted by the State Board of Examiners in lieu of examinations in those subjects for certificates. It is recommended that all who expect to teach, elect in addition courses 35 and 38. Courses 38 and 39 are planned especially to aid those who wish to prepare for supervisory or administrative work.

The departments of education and of agriculture in cooperation offer courses for the training of teachers of agriculture in secondary schools. These consist of 130 term hours in agriculture to be selected from the 146 required for graduation in that department. In the senior year 12 of the hours thus chosen are devoted to specialization in one agricultural field, the following courses in education and psychology being also pursued: in the first term, 33 and 35, each 3 hours a week; in the second term, 36 and 37, each 5 hours a week. A detailed program of studies will be made out for each student by the Professor of Education and the Dean of Agriculture. The relation of the courses in education and agriculture is indicated on pages 71-73.

31 *History of Education*

Junior year, first term, 3 hours a week.

A study of the history of education from the earliest times through the Renaissance and Reformation periods.

32 *History of Education* (continued)

Junior year, second term, 3 hours a week.

This course considers the great movements and the eminent educators from the Renaissance period to the present time. The application of theories to modern practice and the force of education as a factor in civilization are constantly kept in view. The student is required in this and the preceding course not only to learn from a textbook but to do outside reading, present themes, and discuss topics.

33 *Educational Psychology*

Senior year, first term, 4 hours a week.

The application of the laws and methods of general psychology to the problems of education; the fundamental facts of physiological psychology; the learning process; work and fatigue; individual

differences; the psychology of school subjects. (Thorndike's *Educational Psychology, Briefer Course*; readings from Thorndike's *Educational Psychology*, three volumes, and from the periodical literature)

34 *Secondary Education*

Senior year, second term, 4 hours a week.

This course deals with the principles and practice of secondary education. It includes a survey of secondary education; the history of secondary education; secondary education in Europe; types of high schools in the United States; important issues in secondary education; the secondary curriculum; problems of teaching in the high school. (Monroe's *Principles of Secondary Education* and Parker's *Methods of Teaching in High Schools*)

35 *Principles of Education*

Senior year, first term, 4 hours a week.

An effort is made to study the educational process as a whole. The following sample topics receive detailed treatment: Social conceptions of education; function of the school; education and social progress; heredity; recapitulation; sex differences; conclusions from psychology in their application to education.

36 *Agricultural Education and Thesis*

Senior year, second term, 5 hours a week.

This course, offered by a specialist in agriculture, is required of all students preparing to teach agriculture in secondary schools. The following are some of the topics that receive detailed treatment: A survey of secondary education; the curriculum of the agricultural high school; sources of material for instruction; methods of presenting various subjects of the curriculum.

37 *Agricultural Education and Thesis*

Senior year, second term, 5 hours a week.

In this course the student does observation and practice teaching under supervision.

Graduate Courses

38 *Educational Administration*

Graduate and senior elective, second term, 4 hours a week.

An examination of the organization and legal status of school systems; problems of supervision and administration; administrative

control of school systems; school finance; measurement of efficiency in school systems through the use of standard tests and scales; studies and measurements of the school population and of the teaching population. (Cubberley's *Public School Administration*)

A study of a number of the recent school surveys is made by graduate students.

39 *Educational Measurements*

First term, 3 or 4 hours a week.

A study of the standard tests and scales for measurement that have been derived for the various school subjects; the theory underlying their derivation; practice in the use of the various scales; practice in preparing standard tests and giving them to groups of students in the elementary and secondary schools. Some attention is also given to the measurement of retardation and elimination.

HISTORY OF ART

Professor VAN DYKE, course 41

Mr. MORGAN, course 42

41 *Sculpture and Painting*

Senior year, first term, 2 hours a week.

The history and criticism of these arts from their beginning to the present time. (Frothingham and Marquand's *History of Sculpture* and Van Dyke's *History of Painting*)

42 *Architecture*

Senior year, second term, 2 hours a week.

A course of lectures on the history of architecture. These lectures are correlated with those of the preceding course. (Hamlin's *History of Architecture*)

[Courses 43-48 omitted 1916-1917]

43 *The History of Architecture*

Junior year, first term, 3 hours a week.

The entire field of architectural history is covered by means of lectures, recitations, and conferences in which the students are required to report each week upon a certain amount of assigned reading. (Simpson's *A History of Architectural Development*; Marquand's *Greek Architecture*; Anderson and Spiers's *Architecture of Greece and Rome*; Porter's *Medieval Architecture*; Moore's *Gothic and Renaissance Architecture*; and portions of other works as assigned from time to time)

44 *The History of Architecture* (continued)

Junior year, second term, 3 hours a week.

45 *Architectural Design*

Senior year, first term, recitation 2 hours, drawing 5 hours a week.

The classic orders are studied together with the principles of shades, shadows, and perspective. The drawing period is devoted to the preparation of elementary design and wash drawings. (Esquié's *Vignole*)

46 *Architectural Design* (continued)

Senior year, second term, recitation 2 hours, drawing 5 hours a week.

The extra hour takes the place of the required senior course in architecture.

NOTE.—Courses 47 and 48 are offered in alternate years as substitutes for the required course 42 to those who, having taken 43 and 44, do not wish to continue with 45 and 46.

47 *Italian Art*

Senior year, first term, recitation or lecture 1 hour a week.

The sculpture and the painting of the Italian Renaissance. Required reading from various works is assigned.

48 *Medieval Art*

Senior year, first term, recitation or lecture 1 hour a week.

The art of the Middle Ages from the early Christian period to the Renaissance. Reading from various works assigned.

HISTORY

Professor LOGAN, courses 51-59

Dr. PARKER, courses 51-53, 57, 58

51 *Western Europe*

Sophomore year, first term, 4 hours a week.

A brief treatment of the political institutions of the Roman Empire, after which the general history of Western Europe from the Barbarian invasions to the unification of Italy and Germany in the nineteenth century is covered in outline. A few selected topics are studied in detail. Textbook, supplemented by daily use of library. One brief paper, designed to give elementary practice in the comparative study of historical works and easy sources, is required.

52 *Western Europe*

Sophomore year, second term, 4 hours a week.

A continuation of course 51.

Includes a paper similar to that of the first term.

53 *Introduction to the History of Modern Europe*

Junior year, first term, 3 hours a week in the technical science courses.

Beginning with sixteenth century Europe the great political and social movements are traced in outline to the present time.

Method similar to that of courses 51 and 52.

54 *American History*


Junior year, second term, 3 hours a week in the technical science courses.

Social, political, and economic development of the American possessions of Great Britain, followed by outline of United States history. Textbook and lectures; term paper and regular written quizzes on reading.

55 *Political and Constitutional History of England*

Junior year, first term, 3 hours a week in the liberal courses.

The chief emphasis is upon the constitutional side of the period 1066-1485 (period of constitution making), although careful prepara-



tion of the political and general history of England is required. A number of documents comprising the main sources of the Constitution are studied intensively. Textbook, lectures, and term paper.

56 *Political and Constitutional History of England*

Junior year, second term, 3 hours a week in the liberal courses.

A continuation of course 55.

57 *Nineteenth Century Europe*

Senior year, first term, 4 hours a week.

Brief survey of the permanent results of the French Revolution and the Napoleonic era, followed by a more detailed study of the political history of the principal states, 1815-1914. Methods and systems of the chief colonizing nations of the century. Notes and directions are given and special topics assigned to each student. Lectures on the theory of history, the methods and results of the historians of the nineteenth century, etc. Term paper required.

Seniors electing history have a choice between 58 and 59 for the work of the second term.

58 *Nineteenth Century Europe*

Senior year, second term, 4 hours a week.

A continuation of course 57.

59 *American Revolution*

Senior year, second term, 4 hours a week.

Review of the political philosophy of the English and French revolutions, study of the works of American political thinkers of the eighteenth century and of the Convention of 1787. Political history of the revolutionary period.

HISTORY AND POLITICAL SCIENCE

Professor SCOTT

71 *History of Civilization*

Junior year, first term, 3 hours a week.

Guizot's *History of European Civilization* is used as a guidebook.

Collateral readings are assigned.

72 *Elements of Political Science*

Junior year, second term, 3 hours a week.

Fundamentals of the general subject are taught by means of a textbook. The theory and operation of the federative principle in the American system of government are made the subject of special study.

73 *Economics*

Senior year, first term, 3 hours a week.

The class uses as a textbook Seligman's *Principles of Economics* and receives instruction also through lectures and informal discussions. Topics are assigned for special study. At the examination each student submits his term notebook.

74 *Economics*

Senior year, first term, 4 hours a week.

After an inquiry into the history and nature of political economy, topics in each of the departments of the science are assigned to individual members of the class and some economic problems are considered in detail.

75 *Constitutional Law*

Senior year, second term, 4 hours a week.

McClain's *Constitutional Law in the United States* is used as a textbook. Lectures on various features of the constitution in their historical development are given and occasionally an important decision of the Supreme Court is analyzed. Notes of the daily classroom work are required of each student and the notebooks are submitted for examination at the close of the term.

76 *Constitutional Law*

Senior year, second term, 4 hours a week.

The significance and scope of the fundamental principles of the American organic law are studied in the decisions of the Supreme Court of the United States given in the volumes of reports and as treated in Wambaugh's *Cases on Constitutional Law*.

77 *International Law*

Senior year, first term, 1 hour a week.

The peculiar character of this branch of law is emphasized in lectures, and its development, authorities, and sources, and its present status are explained. Special subjects are assigned for individual treatment.

LATIN LANGUAGE AND LITERATURE

Professor KIRK

91 *Prose*

Freshman year, first term, 2 hours a week.

Selections from Livy and Sallust. Review of Roman history in connection with the reading.

92 *Poetry*

Freshman year, first term, 1 hour a week.

Selections from the Latin poets. Study of meters.

93 *Grammar and Composition*

Freshman year, first term, 1 hour a week.

Talks on syntax; prepared and extemporaneous prose composition.

94 *Prose*

Freshman year, second term, 2 hours a week.

Selections from Cicero's philosophical writings.

95 *Poetry*

Freshman year, second term, 1 hour a week.

A continuation of course 92.

96 *Grammar and Composition*

Freshman year, second term, 1 hour a week.

A continuation of course 93.

97 *Horace*

Sophomore year, first term, 2 hours a week.

The *Satires* and *Epistles*. Topics treated in connection with the reading are the private life of the Romans and the study of philosophy at Rome.

98 *Latin Literature*

Sophomore year, first term, 1 hour a week.

Talks on the history of Latin literature are given in class. The prepared work consists in short essays on the subject and in reading selected passages from different authors.

99 *Pliny*

Sophomore year, second term, 2 hours a week.

Selections from the *Letters*; study of Roman society under the early empire.

100 *Latin Literature*

Sophomore year, second term, 1 hour a week.

A continuation of course 98.

101 *Terence*

Junior year, first term, 2 hours a week.

The plays of Terence are read in class, with constant drill in the meters and sight reading.

102 *Grammar*

Junior year, first term, 1 hour a week.

Lectures on forms and inflections are given and selected inscriptions are read in class. In addition each student pursues a course of private reading or of advanced prose composition.

103 *Roman Law*

Junior year, first term, 3 hours a week.

Justinian's *Institutes* is used as a textbook, parts of Book I are read and the whole of Book II, with especial attention to testamentary succession.

104 *Cicero*

Junior year, second term, 2 hours a week.

Study of Cicero's life; reading of selections from the *Letters* and the *Orations*.

105 *Grammar*

Junior year, second term, 1 hour a week.

A continuation of course 102.

106 *Roman Law*

Junior year, second term, 3 hours a week.

Institutes, Book III; intestate succession; the law of contract, with especial attention to sale, in connection with which passages from the *Digest* are read.

107 *Virgil*

Senior year, first term, 3 hours a week.

Passages in Book I of the *Aeneid* are studied intensively; parts of other books, especially VII-XII, are read rapidly. Attention is given to meter, artistic composition, and legendary elements.

108 *Syntax and Composition*

Senior year, first term, 1 hour a week.

Lectures on syntax; advanced prose composition.

109 *Roman Law*

Senior year, first term, 4 hours a week.

Delictal obligations are studied in the *Institutes* and the *Digest*. The historical development of procedure is studied in connection with *Inst.* IV, 6.

110 *Caesar*

Senior year, second term, 3 hours a week.

Rapid reading in Caesar and his continuators; study of the Roman military organization and of the Gallic War.

111 *Syntax and Composition*

Senior year, second term, 1 hour a week.

A continuation of course 108.

112 *Roman Law*

Senior year, second term, 4 hours a week.

The titles on interdicts in the *Institutes* are read, together with passages from the *Digest*, especially on the interdict *unde vi*. In pursuance of this subject, and by way of introducing the student to the Latin of English lawyers, passages from Maitland's *Bracton and Azo* are read, and select cases in Bracton's *Note Book* are studied.

NOTE.—Courses 103, 106, 109, and 112 constitute a course in Roman Law which is optional with the course in Latin constituted by courses 101, 102, 104, 105, 107, 108, 110, and 111.

GREEK LANGUAGE AND LITERATURE

Professor BEVIER

121 *Elementary Greek*

Freshman year, first term, 5 hours a week.

A course in elementary Greek is open to students who have offered a modern language in place of Greek at entrance. Students choosing this course will be obliged to continue with course 122 during the second term and with courses 123 and 124 during the sophomore year.

122 *Xenophon and Homer*

Freshman year, second term, 5 hours a week.

During the second term a course is arranged for those who have taken course 121. Portions of the *Anabasis* and *Iliad* are read in preparation for course 123.

123 *Homer*

Freshman or sophomore year, first term, 4 hours a week.

Five or six books of the *Odyssey* are read in continuation of the preparatory school study of Homer. Drill in Homeric forms and syntax and in prose composition.

124 *Herodotus*

Freshman or sophomore year, second term, 4 hours a week.

Selections from Herodotus amounting to about 100 pages of text are read and exercises are conducted in sight reading from Herodotus and Xenophon. Drill in Ionic forms and syntax and in prose composition.

125 *Lysias*

Freshman or sophomore year, second term, 4 hours a week.

Selected orations of Lysias are read with particular reference to Athenian court procedure and the development of oratory in the fifth century before Christ. Exercises in prose composition.

126 *Plato*

Sophomore year, first term, 3 hours a week.

The *Dialogues* of Plato bearing on the death of Socrates are studied, the *Apology* and *Crito* being read entire. Exercises are conducted in sight reading from the *Memorabilia* of Xenophon.

127 *Demosthenes*

Sophomore year, second term, 3 hours a week.

The *Oration on the Crown* is made the center of the study of Demosthenes as statesman and orator and of the history of his time. Sight reading from Aeschines's *Against Ctesiphon*.

128 *Aristophanes or Euripides*

Sophomore year, second term, 3 hours a week.

Two plays are read in class. Lectures on the development of tragedy and comedy with illustrative readings from some of the great tragedies and from Aristophanes.

129 *The Historians*

Junior year, first term, 3 hours a week.

The center of the term's work is the history of Thucydides, at least one entire book being read in class. Portions of Herodotus and

Thucydides are read at sight. It is aimed to give the student a vivid picture of the Peloponnesian War and to trace the rise of prose writing as an art.

130 *Attic Oratory*

Junior year, second term, 3 hours a week.

The class readings are taken from a number of orators from Antiphon to Demosthenes, the latter being generally the center of the term's study. The purpose is to trace the growth of prose writing to its full maturity and incidentally to illustrate the history of Athenian institutions in the fourth century.

131 *Lyric Poetry*

Junior year, second term, 3 hours a week.

Selections from a number of poets are read and a careful study of the metrical form is required, both for the proper appreciation of the lyrics themselves and to prepare the way for the easy understanding of the dramatic choruses. Students are encouraged to make metrical translations.

132 *The Drama*

Senior year, first term, 4 hours a week.

At least two complete plays, one of Sophocles and one of Aeschylus or Euripides, are read in class and each member of the class will read privately at least one other. Memorizing of choral passages is recommended. The lectures will treat the development of the drama as a literary type.

133 *The Philosophic Dialogue*

Senior year, second term, 4 hours a week.

The class readings are taken from Plato and are varied from year to year. The *Republic* or the *Protagoras* is made the center of the term's study.

HEBREW

Dr. RAVEN

These courses are intended especially for seniors preparing for the ministry, although they are open to other seniors.

141 Hebrew

Senior year, first term, 2 hours a week.

Hebrew grammar. Pronunciation. Translation and analysis of simple historical selections of the Old Testament.

142 Hebrew

Senior year, second term, 2 hours a week.

Hebrew syntax. Rapid reading of selected portions of the poetical books of the Old Testament. Hebrew vocabulary.

ENGLISH LANGUAGE AND LITERATURE

Professor WHITMAN, courses 151, 153-156, 161-166

Professor BARBOUR, course 152

Associate Professor TWISS, courses 151, 153-156, 158, 159

Assistant Professor HALE, courses 151, 153-157, 160

151 Essays

Freshman, sophomore, and junior years, 1 each term; senior year, 1 first term; required of all students in the four-year courses.

The Librarian responds to requests for lists of books and articles relating to the subjects assigned and students are expected to make these exercises occasions for a widened acquaintance with literature.

152 Public Speaking

Freshman year, 1 hour a week; other years, 6 times each term, except junior and senior years in technical courses; twice each term for these.

Declamations from masterpieces of oratory and extempore speaking on current topics and questions of vital issue are required during the

freshman year and first year of the short course, and original orations and extempore speaking during the sophomore year and second year of the short course. In the junior and senior years original orations and extempore speaking are required in the arts, letters, and general science courses; in the technical science courses extempore speaking alone is required. These are prescribed for all students except those taking the short courses in Agriculture and practical clay-workers in the short course in Clay-working.

The course includes a critical study of the methods of the great English and American orators. The scope of instruction embraces physical culture, respiration, training of the voice, enunciation, the principles of gesture, correction of faults and mannerisms.

153 *Rhetoric and Composition*

Freshman year, first term, 1 hour a week.

The theory of composition, emphasizing the construction of the theme and the fundamental principles of unity, coherence, and emphasis; the writing and criticism of themes; conference.

154 *Rhetoric and Composition* (continued)

Freshman year, second term, 1 hour a week.

The science of rhetoric, especially the treatment of exposition, argumentation, criticism, narration, and description as types of prose.

155 *History of English Literature*

Freshman year, first term, 2 hours a week in the technical science courses, 3 hours a week in the other courses.

An outline course in the history of English literature with readings in English history and biography as well as in the authors studied.

156 *History of English Literature* (continued)

Freshman year, second term, 2 hours a week in the technical science courses, 3 hours a week in the other courses.

157 *American Literature*

Sophomore year, first term, 2 hours a week.

The history of American literature; class and supplementary reading, with reports. A principal theme of the course is: the English source relations and the national independence of American literature.

158 *Literary Criticism*

Sophomore year, first term, 3 hours a week.

A concise presentation of the nature and development of language, literature as an art process, the literary types, and the principles of criticism; extensive reading of classic examples. Required supplementary readings and reports.

159 *Literary Criticism* (continued)

Sophomore year, second term, 3 hours a week.

160 *Shakespeare*

Sophomore year, second term, 2 hours a week.

The reading of several plays with the main purpose of intelligent appreciation of Shakespeare's human philosophy and dramatic power; study of Elizabethan conditions.

161 *Old English*

Junior year, first term, 3 hours a week.

An elementary course in the grammar and literature of Old English. Cook's *First Book in Old English* is used as a textbook and one of the longer poems is read entire.

162 *Middle English*

Junior year, second term, 3 hours a week.

Selections in prose and verse from Cook's *Literary Middle English Reader*, Osgood's edition of *The Pearl*, Langland's *Piers Plowman*; readings in Chaucer.

163 *English Drama*

Junior year, first term, 3 hours a week.

A study of the English drama, from the miracle plays to the closing of the theatres in 1642, from the literary and the dramatic point of view. Specimens of the pre-Elizabethan drama and one or more plays of the chief dramatists from 1580 to 1640 (Shakespeare excepted) are read and discussed.

164 *Shakespeare*

Junior year, second term, 3 hours a week.

A critical and appreciative study of selected plays, with especial attention to sources, annotations, and the development of Shakespeare as a dramatic artist.

165 *English Prose of the Nineteenth Century*

Senior year, first term, 4 hours a week.

A course of lectures, recitations, readings, and reports upon Carlyle, Ruskin, Arnold, and Newman.

166 *English Poetry of the Nineteenth Century*

Senior year, second term, 4 hours a week.

A course of lectures, recitations, readings, and reports upon Wordsworth, Coleridge, Byron, Shelley, Keats, Tennyson, and Browning.

ROMANCE LANGUAGES

Professor DAVIS, courses 181-184, 189-194

Associate Professor BILLETDOUX, courses 181, 182, 185-188, 195-198

Mr. KIMBALL, courses 181-186

In addition to the curriculum courses in this department, students of French may attend the lectures and conversation classes of the "Alliance française de New Brunswick."

First Year French for Sophomores and Juniors181 *French A: Grammar*

First term, 3 hours a week.

Rudiments of the grammar—pronunciation, inflection, the elementary laws of syntax and their application—accompanied by the translation of simple prose, writing from dictation, and oral and written exercises in composition. (Fraser and Squair's (*Complete*) *French Grammar* and the same authors' *Shorter French Course*)

182 French A: Reading

Second term, 3 hours a week.

Translation and sight reading of selections from modern prose writers, with constant reference to morphology and idiom in connection with the text. (Kuhn's *French Reading for Beginners*, Aldrich and Foster's *French Reader*, Koren and Chapman's *French Reader*)

Second Year French for Sophomores, Juniors, and Seniors

Prerequisite: course 182 or two years of French in school.

Seniors receive in addition practice of one hour a week in speaking and writing French.

183 French B: Modern Fiction

First term, 3 hours a week.

The Romantic School—texts of various writers from Rousseau to Hugo with a brief presentation of the authors' lives, writings, and style. Composition and oral practice.

184 French B: Modern Fiction (continued)

Second term, 3 hours a week.

Further study of the novel with special attention to realism. Such authors as Balzac, Flaubert, Daudet, and Maupassant are read. Composition and oral practice.

Advanced Sophomore French

Prerequisite: three or more years of French.

185 French C: Nineteenth Century

First term, 3 hours a week.

A study of standard prose in both novel and drama, especially the writings of Hugo, Sand, Balzac, Flaubert, and Scribe.

Pronunciation and dictation; grammar and composition.

186 French C: Nineteenth Century (continued)

Second term, 3 hours a week.

Further study of modern prose writers, particularly Augier, Daudet, Loti, Dumas *filis*, Sardou, and Rostand.

Oral and written practice in composition.

Advanced Junior French

Prerequisite: course 184 or 186.

187 French D: Eighteenth Century

First term, 3 hours a week.

A study of the writers of the eighteenth century, especially Voltaire; also collateral reading of a certain amount of contemporary fiction as basis for composition and oral practice.

188 French D: Eighteenth Century (continued)

Second term, 3 hours a week.

Further study of the eighteenth century: Rousseau, Montesquieu, Beaumarchais, the Encyclopedists; also collateral reading of a certain amount of contemporary fiction as basis for composition and oral practice.

Advanced Senior French

Prerequisite: course 184, 186 or 188.

189 French E: Classic Drama

First term, 4 hours a week.

A study of the dramatic literature of the seventeenth and eighteenth centuries, particularly that of Corneille, Racine, Molière, Voltaire, and Beaumarchais. Composition and oral practice.

190 French E: Modern Drama and Prose

Second term, 4 hours a week.

A study of modern authors, with rapid reading and synopses. Composition and oral practice.

First Year Italian**191 Italian A: Grammar**

Junior year, first term, 3 hours a week.

Pronunciation, inflection, the laws of syntax and their application. Oral and written exercises in composition.

192 Italian A: Reading

Junior year, second term, 3 hours a week.

Translation and sight reading of simple prose. Composition and oral exercises. (Marinoni's *Italian Reader*, Bowen's *Italian Reader*, Wilkin's and Altrocchi's *Italian Short Stories*)

Second Year Italian

Prerequisite: course 192.

193 Italian B: Modern Authors

Senior year, first term, 4 hours a week.

A study of modern Italian literature. Manzoni, De Amicis, Fogazzaro, D'Annunzio, Carducci. Composition and oral practice.

194 Italian B: Dante

Senior year, second term, 4 hours a week.

A study of Dante's *Divina Commedia* with collateral reading. Composition and oral practice.

First Year Spanish**195 Spanish A: Elementary Course, Grammar**

Junior year, first term, 3 hours a week.

Pronunciation, inflection, the laws of syntax and their application. Writing from dictation, oral and written exercises in composition. (Hills and Ford, Coester, Espinosa and Allen)

196 Spanish A: First Readings

Junior year, second term, 3 hours a week.

Translation and sight reading of modern prose stories, with composition and oral exercises.

Second Year Spanish

Prerequisite: course 196.

197 Spanish B: Fiction

Senior year, first term, 4 hours a week.

A study of nineteenth century fiction: Valera, Galdós, Alarcón, Valdés, Pereda.

Abundant exercises in speaking and writing Spanish.

198 *Spanish B: Drama*

Senior year, second term, 4 hours a week.

Translation and analysis of dramas of the nineteenth century: Larra, Hartzenbusch, Tamayo y Baus, Echegaray.

Advanced composition. Thorough practice in the colloquial language.

GERMAN LANGUAGE AND LITERATURE

Professor NEWTON, courses 215, 216, 225, 226

Associate Professor PAYSON, courses 213, 214, 221-224

Assistant Professor HAUCH, courses 211, 212, 217-220

Mr. JOHNSON, courses 213, 214

Courses for Freshmen**211 *German A: First Year***

First term, 4 hours a week, for students who have entered college without German.

Thorough drill in pronunciation, inflections, and elements of syntax; composition; translation.

212 *German A: First Year (continued)*

Second term, 4 hours a week.

Translation and composition continued; special drill in the strong and irregular verbs.

213 *German B: Third Year*

First term, 4 hours a week, for students who have entered with two years of German.

Rapid translation of recent German fiction; composition; conversation.

214 *German B: Third Year (continued)*

Second term, 4 hours a week.

Translation of selected novels and essays; composition; conversation.

215 German C: Fourth Year

First term, 4 hours a week, for students who have entered with three years of German.

The German drama; literary and scientific German; topics from German literature.

216 German C: Fourth Year (continued)

Second term, 4 hours a week.

A course in German history based on selections from the standard German historians; literary and scientific German; topics from German literature.

Courses for Sophomores and Juniors**217 German D: First Year**

Sophomore or junior year, first term, 3 hours a week, for students who have had no German.

Thorough drill in elementary grammar and composition; translation of narrative German.

218 German D: First Year (continued)

Sophomore or junior year, second term, 3 hours a week.

Grammatical drill and composition continued; rapid translation of narrative and colloquial German.

219 German E: Second Year

Sophomore year, first term, 3 hours a week, for students who have taken courses 211 and 212.

Translation of the more popular German classics.

220 German E: Second Year (continued)

Sophomore year, second term, 3 hours a week.

Translation of German classics continued; scientific German.

221 German F: Third Year

Sophomore or junior year, first term, 3 hours a week (see note on the following page).

Rapid translation of nineteenth century literature; composition; conversation.

222 *German F: Third Year (continued)*

Sophomore or junior year, second term, 3 hours a week.

Continued translation of nineteenth century literature; composition; conversation.

223 *German G:*

Junior year, first term, 3 hours a week.

An advanced course in German literature. Study of the Storm and Stress Period; readings from the dramas of Goethe and Schiller; consideration of the intellectual, political, and social circumstances of the period.

In alternate years, a study of the period of Enlightenment, with special consideration of the life and times of Lessing and readings from *Laokoon*, *The Hamburg Dramaturgy*, and Herder's *Critical Forests*.

224 *German G (continued)*

Junior year, second term, 3 hours a week.

Further study of the Storm and Stress Period. Readings from the minor authors of the period, such as Klinger, Leisewitz, Lenz, Wagner, Müller.

In alternate years a study of the grammar of Middle High German, with readings from the *Nibelungenlied*.

Courses for Seniors

225 *German H: Advanced Elective*

First term, 4 hours a week.

Study of medieval and early modern German classics; composition.

226 *German H: Advanced Elective (continued)*

Second term, 4 hours a week.

German classics continued.

NOTE.—Courses 221 and 222 are elective (subject to the approval of the head of the technical course if such be pursued) for Bachelor of Science sophomores, Bachelor of Arts juniors and General Science juniors that are competent to take third year work in German.

MATHEMATICS

Professor MORRIS, courses 241, 243-246, 256, 257

Professor BREAZEALE, courses 242, 247, 251, 253

Professor BRASEFIELD, courses 242, 247, 250, 252, 254, 255

Assistant Professor STONE, courses 241-244, 247-249, 251, 253

Mr. REES, courses 242, 247, 251, 253

241 Algebra

Freshman year, first term, 4 hours a week.

Graphs, continued fractions, permutations and combinations, binomial theorem, indeterminate coefficients, method of differences, logarithms, complex quantities, elements of the theory of equations, solution of equations of higher degree than the second, determinants, series.

242 Algebra and Trigonometry

Freshman year, first term, 5 hours a week.

Some of the topics studied are the elements of complex numbers, review of the quadratic including its graph, undetermined coefficients and partial fractions, binomial theorem for rational exponents, series, logarithms, the theory of equations including Horner's method of solving numerical equations. A review of plane trigonometry.

243 Plane Trigonometry

Freshman year, first half of second term, 4 hours a week.

The course includes the development of the principal formulas and the solution of right and oblique triangles.

244 Solid Geometry

Freshman year, latter half of second term, 4 hours a week.

245 Trigonometry and Analytic Geometry

Sophomore year, first term, 3 hours a week.

Trigonometric functions of an angle and of the sum and difference of two angles, solution of plane triangles. Spherical trigonometry. Conic sections begun.

246 *Analytic Geometry* (continued)

Sophomore year, second term, 3 hours a week.

Conic sections continued.

247 *Analytic Geometry*

Freshman year, second term, 5 hours a week.

248 *Analytic Geometry and Calculus*

Junior year, first term, 3 hours a week.

This course is in continuation of course 246 and consists of advanced work in analytic geometry and the calculus.

Prerequisite: course 246.

249 *Calculus* (continued)

Junior year, second term, 3 hours a week.

250 *Analytic Geometry and Calculus*

Sophomore year, first term, 3 hours a week.

Plane and solid analytic geometry, differential calculus begun.

251 *Differential Calculus*

Sophomore year, first term, 4 hours a week.

252 *Calculus*

Sophomore year, second term, 3 hours a week.

Differential calculus completed, integral calculus.

253 *Calculus*

Sophomore year, second term, 4 hours a week.

The differential calculus is completed and the integral calculus begun.

254 *Mechanics*

Junior year, first term, 4 hours a week.

Composition and resolution of forces acting on a particle and on a rigid body, couples, centers of mass, laws of friction, numerous practical examples.

255 *Mechanics* (continued)

Junior year, second term, 2 hours a week.

Kinematics, motion of projectiles, kinetics, laws of motion, impact, work and energy, moments of inertia, rotary motion, numerous practical examples.

256 *Elective Mathematics*

Senior year, first term, 4 hours a week.

Among the subjects offered are: theory of equations, analytic geometry of three dimensions, differential equations, theory of functions, analytic mechanics, mathematical analysis.

Prerequisite: courses 248, 249.

257 *Elective Mathematics* (continued)

Senior year, second term, 4 hours a week.

ASTRONOMY

Professor BREAZEALE

[Courses 271, 272 omitted 1916-1917]

271 *Theoretical and Practical Astronomy*

Senior year, first term, 4 hours a week.

Spherical astronomy, coordinate systems, theory of astronomical instruments, reduction of observations, method of least squares, exercises in logarithmic computation, observatory work.

Prerequisite: courses 248 and 249 or 252 or 253.

272 *Theoretical and Practical Astronomy* (continued)

Senior year, second term, 4 hours a week.

Celestial mechanics, fundamental principles and definitions; rectilinear motion, central forces, the potential and attraction of masses; problems of two, three, and n bodies; calculation of orbits; observatory work.

PHYSICS

Professor VAN DYCK, courses 281, 282, 287-290

Mr. MASON and Mr. BAKER, courses 283-286

281 *Elementary Physics*

Sophomore year, first term, 2 hours a week; also first year in the short course in Clay-working.

This general course includes the fundamentals of mechanics, hydromechanics, and static electricity. The presentation is by lectures and recitations based on a textbook. Recitations are both oral and written. (Carhart's *College Physics*)

282 *Elementary Physics* (continued)

Sophomore year, second term, 2 hours a week; also first year in the short course in Clay-working.

The work of this term includes heat, sound, light, magnetism, and electric currents.

283 *Physical Laboratory*

Sophomore year, first term, 5 hours a week.

Advanced laboratory work in the subjects of courses 281 and 282.

284 *Physical Laboratory* (continued)

Sophomore year, second term, 5 hours a week.

285 *Physical Laboratory*

Sophomore year, first term, 3 hours a week.

General laboratory work in subjects of courses 281 and 282.

286 *Physical Laboratory* (continued)

Sophomore year, second term, 3 hours a week.

The two following courses are intended to familiarize students with the use of instruments of measurement and also with methods of practically working out problems in the various branches of physics. They are open only to those who elect mathematics.

287 Laboratory Course and Recitations

Junior year, first term, 3 hours a week.

Fundamental measurements and experiments under the head of mechanics.

288 Laboratory Course and Recitations (continued)

Junior year, second term, 3 hours a week.

Experiments under heat and light.

289 Electricity and Magnetism

Senior year, first term, 4 hours a week.

Laboratory and recitation course in electricity and magnetism.

290 Selected Subjects

Senior year, second term, 4 hours a week.

Laboratory and recitation course in selected subjects.

CIVIL ENGINEERING

Professor TITSWORTH, courses 305, 307, 310, 315-317, 319, 321

Assistant Professor JOHNSON, courses 301, 302, 303, 306, 312, 322

Assistant Professor LENDALL, courses 304, 306, 309, 313, 317, 321, 323,
325

Assistant Professor STEPHENSON, courses 308, 311, 314, 315, 318-320,
324

Special lectures are given in this department from time to time by men who have attained eminence in the practice of civil engineering.

301 Descriptive Geometry

Sophomore year, first term, recitation 2 hours, drafting 3 hours a week.

A recitation course embracing problems of the point, line, and plane; the classification of lines and surfaces; problems in surface

tangencies; intersections and development of surfaces; shades, shadows, and perspectives. The drafting course includes accurate construction of problems with applications.

302 *Surveying*

Sophomore year, second term, recitation 2 hours, field practice 3 hours a week.

The study of instruments and their adjustments; the theory of chain, compass, transit, and plane-table surveying, and leveling; methods of computing areas and laying out and dividing land. The field practice includes the application of classroom instruction.

303 *Surveying*

Sophomore year, second term, 2 hours a week.

This is a course designed to meet the special needs of students in electrical engineering.

304 *Machine Drawing*

Sophomore year, first term, 3 hours a week.

Dimensional sketches of machine parts and finished drawings made from sketches, conforming as nearly as possible to actual shop practice.

305 *Topography and Lettering*

Sophomore year, second term, 3 hours a week.

A course in plain and colored topography, in the correct formation of letters, in lettering and proper spacing, in drawing titles for maps.

306 *Field Practice in Surveying*

Sophomore-junior vacation, 100 hours.

Practical applications in the field of methods of surveying.

307 *Graphic Statics*

Junior year, first term, 3 hours a week.

A course in the graphic representation of forces and applications of graphic methods; graphic determination of stresses in members of roof and bridge trusses; tracing curves showing results of statistical data and mechanical movements.

308 *Railway Engineering*

Junior year, second term, recitation 2 hours, field practice 3 hours a week.

Embracing problems in simple, reversed, compound, and transition curves; turnouts, crossings, and frogs; excavations, embankments, and earthworks; reconnaissance and location.

The field practice includes methods of platting curves, profiles, mass diagrams, cross-sections, and topographical features. All necessary field operations, such as laying out curves, running profiles, slope staking, topography, and staking out railway structures are carefully considered.

309 *Mechanics of Materials*

Junior year, first term, 4 hours a week.

Principles of stress and strain; laws of elasticity; pure stresses, as tension, compression, and shear; reactions and moments of simple and cantilever beams; shear and moment diagrams; theory of flexure; restrained and continuous beams; investigation of columns and column formulas; torsion; impact and fatigue.

310 *Masonry Construction*

Senior year, second term, recitation and design 4 hours a week.

A study of the materials and the classifications of masonry; methods of construction and the principles and practice of the design of foundations, dams, retaining walls, abutments, piers, culverts, and arches.

311 *Field Practice in Railroad Surveying*

Junior-senior vacation, 100 hours.

The reconnaissance, preliminary, and final locations, and the levels of a short line of railroad are made.

312 *Theory of Structures*

Junior year, second term, 3 hours a week.

A study of reactions, shears, and moments and of the character and magnitude of the stresses in structures, principally roofs and bridges of different types, due to dead loads and uniform and moving

live loads, by both the analytic and graphic methods; the examination of bridge structures in the immediate vicinity and sketching and drawing the different members and joints.

313 *Hydraulic Engineering*

Junior year, second term, recitation 3 hours, laboratory 3 hours a week.

Hydrostatics; theoretical hydraulics; flow through orifices and over weirs; flow in pipes, tubes, and canals; stream measurements; hydrodynamics; principles of the design of water-wheels, turbines, and pumps.

The laboratory exercises consist of experiments on orifices, weirs, meters, friction losses in pipe lines, rating of current meters and stream measurements by rod floats and current meter.

314 *Concrete, Plain and Reinforced*

Senior year, first term, recitation 3 hours, laboratory 3 hours a week.

A lecture and recitation course treating of the properties of cements, sands, and aggregates, of standard tests on cements, and of the principles of design and application of reinforced concrete for use in construction. This course also comprises an examination of the characteristic physical properties of cement and actual practice in methods of conducting tests in accordance with standard specifications. Well known brands of cement are tested and complete reports of observed results are submitted by students. The chemical analysis of cement is also briefly considered.

315 *Testing Materials—Laboratory*

Junior year, second term, 3 hours a week.

A course designed to give the student a practical knowledge of the use of testing machines and of the proper conduct of actual tests of structural materials such as steel, stone, brick, and concrete. The behavior of these materials under stress and their fundamental characteristics are carefully studied by means of plotted test curves.

316 *Theory of Structures* (continued)

Senior year, first term, recitation 2 hours, design 4 hours a week.

Continuation of course 312 in the theory and design of structures; the determination of stresses in cantilever, arch, swing, and suspension bridges; designs of structures.

317 *Public Water Supplies*

Senior year, first term, recitation 2 hours, design 3 hours a week.

A study of the means and methods of public water-supply and its purification for potable and household uses. The designs of the principal features of a complete water-works system.

318 *Highway Engineering*

Senior year, second term, 2 hours a week.

A lecture and recitation course embracing the principles of road and street construction and maintenance, the investigation of paving materials and the proper methods of applying them.

319 *Geodetic Surveying and Practical Astronomy*

Senior year, second term, recitation 3 hours, field work 3 hours a week.

A lecture and recitation course treating of the measurement of arcs to determine the figure of the earth, of practical methods of determining time, latitude, longitude, and azimuth, of the determination of geodetic position, of precise leveling, of plane-table and hydrographic surveying, and field and laboratory work in connection therewith.

320 *Railway Economics*

Senior year, first term, recitation 2 hours, design 3 hours a week.

A lecture and recitation course in the consideration of the selection of proper grades, curvature and types of structure to fit existing traffic conditions and to allow for future developments. A critical study of train resistance; influence of curvature and distance on operating expenses; rise and fall; signaling; yards, stations, and other structures; valuation and depreciation of railway property; financing of railway projects and improvements; maintenance-of-way practice and methods; selection of rolling stock. Designing railway yards and terminals and

all structures that come under the maintenance-of-way department of a modern railroad. A critical examination of and report on an existing terminal is made to determine its fitness to meet the necessary requirements.

321 *Sewerage*

Senior year, second term, recitation 2 hours, design 3 hours a week.

A study of sanitary methods of treating sewage and of its disposal. Design of sewers and of sewage disposal plants.

322 *Bridge Design*

Senior year, second term, 3 hours a week.

A study of structural shapes followed by the design of a through railway bridge and of a deck plate girder bridge, including the making of complete detail drawings and an estimate of weight and cost together with bill of materials.

323 *Hydraulic Engineering*

Senior year, first term, 3 hours a week.

A course similar to 313 but especially planned for students in mechanical engineering. Particular attention is given to hydraulic machines.

Graduate Courses

324 *Reinforced Concrete Construction*

A special graduate course continuing the work of 314.

325 *Sanitary, Hydraulic, and Irrigation Engineering*

A special graduate course continuing the work of 313.

ELECTRICAL ENGINEERING

Professor THOMPSON, courses 331, 335, 339, 340, 344-347

Mr. MASON, courses 332-334, 336-338, 341, 343

331 *Elements of Direct Current Engineering*

Junior year, first term, 3 hours a week.

A review of the laws of the electric and magnetic circuit with particular reference to their application to the dynamo. Special

attention is given to the study of direct current dynamos and motors; their construction, operation, regulation, characteristics, management, and the methods of testing them. Illustrative problems.

332 *Telephones and Telegraphs*

Junior year, first term, 2 hours a week.

A study of the physical theory and the principles of operation of various forms of telephonic and telegraphic transmitting and receiving apparatus and systems.

333 *Theory of Electrical Measurements*

Junior year, first term, 1 hour a week.

A classroom course preparatory for and discussing the theory of the methods of measurement which are used in the laboratory in course 334.

334 *Electrical Laboratory*

Junior year, first term, 5 hours a week.

This course covers the methods for measuring resistance, current, electromotive forces, capacity, self-induction, the magnetic properties of iron, etc., and the calibration of commercial measuring instruments.

335 *Elements of Alternating Current Engineering*

Junior year, second term, 5 hours a week.

An introductory study of the theory of alternating currents, and an application of this theory to the study of the construction, characteristics, and operation of alternators, induction and synchronous motors, rotary converters and transformers. Illustrative problems.

336 *Dynamo Laboratory*

Junior year, second term, 3 hours a week.

A course in the operation and testing of series, shunt, and compound wound generators and motors, and their auxiliary apparatus.

337 *Dynamo Laboratory*

Junior-senior vacation, 50 hours.

Supplementary to course 336 and including the operation of transformers, induction motors, and other alternating current machinery.

338 *Illuminating Engineering*

Senior year, first term, 2 hours a week.

A course devoted to a study of commercial illuminants, their methods of installation, relative efficiencies, and the design of lighting systems.

339 *Advanced Alternating Currents*

Senior year, first term, 4 hours a week.

An advanced study of the theory of alternating currents and its application to alternating current generators and transformers.

340 *Advanced Alternating Currents* (continued)

Senior year, second term, 4 hours a week.

An advanced study of synchronous motors, rotary converters, and induction motors. Calculation of alternating current apparatus.

341 *Electric Power Transmission*

Senior year, first term, 2 hours a week.

A study of the application of electricity to power transmission with special reference to the methods of transmission line construction and the operating characteristics of transmission lines.

342 *Electric Traction*

Senior year, second term, 3 hours a week.

The construction, equipment, and operation of different types of electric railways. Application of electric traction to steam road conditions; predeterminations of speed time curves and the power required for different types of runs.

343 *High Voltage Engineering*

Senior year, second term, 2 hours a week.

A brief course on the phenomena peculiar to high voltage transmission lines and a study of surges and transient phenomena.

344 *Dynamo Laboratory*

Senior year, first term, 5 hours a week.

Advanced testing of direct current apparatus including the determination of the characteristics, regulation, and efficiency of generators and motors. Elementary alternating current measurements accompanying the classroom work in course 339.

345 *Dynamo Laboratory* (continued)

Senior year, second term, 5 hours a week.

Experimental studies and tests of alternating current generators and motors, rotary converters, transformers, and auxiliary apparatus; measurement of power in polyphase circuits.

346 *Electrical Design*

Senior year, first term, 2 hours a week.

The design of a direct current generator or motor.

347 *Electrical Design* (continued)

Senior year, second term, 2 hours a week.

The design of a transformer, an induction motor or a switchboard.

MECHANICAL ENGINEERING

Professor HECK, courses 359-364, 367-369, 371-373, 377, 378

Assistant Professor COUCH, courses 351-358, 366, 370, 374-376

Assistant Professor LENDALL, course 365

The studies given by the department, here described, are combined in related groups instead of being arranged by years.

Machine Drawing and Design**351 *Machine Drawing***

Sophomore year, first term, 5 hours a week in the mechanical and electrical engineering courses.

Dimensioned sketches and finished drawings of machine parts. Practice in reading drawings. Practical problems in intersections and developments. Empirical design of machine parts, with emphasis upon the technique of engineering drawing.

352 *Machine Drawing*

Sophomore year, second term, 5 hours a week.

A continuation of course 351.

353 *Elements of Machine Design*

Junior year, second term, 3 hours a week in the electrical engineering course.

Proportioning of machine parts, empirical and rational; design of transmission machinery.

354 *Machine Design*

Senior year, first term, 4 hours a week in the ceramics course.

Machine drawing and elementary machine design.

355 *Machine Design*

Senior year, second term, 4 hours a week.

A continuation of course 354.

356 *Machine Design*

Senior year, first term, 6 hours a week.

Proportioning of machine parts, such as fastenings, simple frames, gearing, shafting, and bearings. Analysis of actual designs. Original designing of simple machines to meet specified conditions.

357 *Machine Design*

Senior year, second term, 6 hours a week.

A continuation of course 356.

Machine Construction**358 *Machine Elements***

Sophomore year, first term, 4 hours a week in the mechanical and electrical engineering courses.

A course of recitation, lectures, and shop visits, covering the general form of common machines and their constructive details. The aim is to give familiarity with the elements of machines, and emphasis is laid upon practice in rapid sketching. Closely correlated with course 351.

359 *Constructive Processes*

Sophomore year, second term, 5 hours a week.

A systematic study, along general lines, of constructive processes in foundry, forge, and machine shop. Visits to local plants. Shop practice in the production of simple forms in wood and metal, with hand tools and on the lathe and planer.

360 *Machine Construction*

Sophomore-junior vacation, 100 hours.

Shop work of course 359 continued. Visits of inspection to various shops and manufacturing plants within a range of 30 to 60 miles; note-taking, lectures, and references. The aim is to give a general familiarity with metallurgical and shop processes in machine construction, from blast furnace to finished product.

361 *Machine Shop Methods*

Junior year, first term, 3 hours a week.

A closer study of machine tool operations and of methods, fixtures, etc. A graded series of shop exercises, advancing from those in courses 359 and 360.

362 *Materials and Tools*

Junior year, second term, 2 hours a week.

Properties of the materials used in machine construction. Cutting tools and their action. Experimental work in making and testing simple tools.

363 *Shop Design*

Senior year, first term, 2 hours a week.

The correlation and organization of processes and equipment. Shop layout and general design. Study of power transmission and of handling problems.

364 *Engineering Economics*

Senior year, second term, 2 hours a week.

Elementary and fundamental principles of cost keeping, management, and efficiency.

Mechanics of Materials and of Machinery**365 *Mechanics of Materials***

Junior year, second term, 4 hours a week in the mechanical and electrical engineering courses.

Properties of engineering materials, strength, elasticity, etc. Theory of beams, columns, shafts, etc. Elementary theory of elasticity.

366 *Strength of Materials*

Senior year, second term, 2 hours a week in the ceramics course.

A short course in mechanics and strength of materials, to accompany course 355.

367 *Mechanism and Kinematics*

Junior year, first term, recitation 2 hours, drafting 5 hours a week.

A systematic study of mechanism, with examples mostly from the fields of transmission machinery, machine tools, engines, and transportation machinery. Graphical analyses of fundamental mechanisms, going so far as displacements and velocities, and including the layout of gears and cams.

368 *Graphics of Structures and of Machines*

Senior year, first term, recitation 1 hour, drafting 5 hours a week.

Determination of forces in roof trusses, crane frames, etc., and of stresses in machine members. Analysis of impressed forces in machines, including friction but stopping short of kinetic forces.

369 *Kinematics and Dynamics*

Senior year, second term, recitation or lectures 2 hours, drafting 5 hours a week.

Velocities and accelerations in linkage mechanisms and with cams and noncircular gears. Inertia force actions in engines, etc., balancing of engines, gyroscopic action, stress in rotating bodies.

Heat and Power Engineering**370 *Steam Boilers and Engines***

Junior year, first term, 3 hours a week.

An elementary descriptive course in steam engineering. For the civil engineering and ceramics students it is general, for the mechanical and electrical engineers it is concerned chiefly with boilers and their accessories and the generation of steam.

371 *Thermodynamics*

Senior year, first term, 3 hours a week in the mechanical and electrical engineering courses.

A study of the theory and performance of the steam boiler, engine, and turbine, and of the internal combustion engine.

372 *Thermodynamics*

Senior year, second term, 3 hours a week.

The general principles of thermodynamics, with review of their application in the steam plant and a closer study of the internal combustion engine; the principles of heating and ventilation and of refrigeration.

373 *Power Plant Engineering*

Senior year, second term, 2 hours a week in the mechanical and electrical engineering courses.

Layout of plant, selection and combination of units, economics of operation, etc.

Mechanical Engineering Laboratory**374 *Mechanical Instruments and Laboratory***

Junior year, second term, recitation 1 hour, laboratory 3 hours a week in the mechanical and electrical engineering courses.

Use and calibration of instruments for measuring area, fluid volume, weight, pressure (including the indicator), temperature, time, speed, quality of steam, etc.

375 Mechanical Laboratory

Junior-senior vacation, 50 hours in the mechanical and electrical engineering courses.

Simple tests of steam engines, turbines, and pumps, of gas engines, of the injector and pulsometer, tests with dynamometers, etc.

376 Steam Engineering Laboratory

Junior year, second term, recitation 1 hour, laboratory 3 hours a week in the civil engineering and ceramics courses.

A short general course on engineering instruments and the simpler power and economy tests, selected from the subject matter of courses 374 and 375.

377 Mechanical Laboratory

Senior year, first term, 3 hours a week.

Further and fuller work along the lines of course 375, with testing of materials and some hydraulic experiments. Testing of power units with full analysis of performance and efficiency tests of working plants.

378 Mechanical Laboratory

Senior year, second term, 3 hours a week.

A continuation of course 377.

MECHANICAL DRAWING

Assistant Professor JOHNSON, courses 381, 382

Assistant Professor LENDALL, courses 381, 382

Assistant Professor STEPHENSON, courses 381, 382

381 Drafting

Freshman year, first term, 5 hours a week; also second year in the short course in Clay-working.

Instruction is given in plain lettering, in the use of drafting instruments, in the drawing of simple designs, in the construction

and use of scales, and in the construction of geometric problems. Orthographic projections begun. One hour each week is devoted to classroom instruction.

382 *Drafting* (continued)

Freshman year, second term, 5 hours a week.

This course includes the projections of geometric solids on horizontal, vertical, profile, and supplementary planes; the intersection and development of surfaces; elementary machine drawing and sketching; isometric projection of simple figures. One hour each week is devoted to classroom instruction.

Other courses in mechanical drawing are described in connection with the departments of Civil, Electrical, and Mechanical Engineering, on the preceding pages.

CHEMISTRY

Professor WRIGHT, courses 404-408, 413

Associate Professor DE REGT, courses 393-398, 413

Associate Professor SMITH, courses 399-403, 411, 413

Associate Professor NORTH, courses 391, 392, 409, 410, 413

Mr. MACDONALD

Mr. SCHMID

Mr. COLVILLE

Mr. THOMSON

391 *General Chemistry*

Freshman year, first term, lectures 2 hours, recitation 1 hour, laboratory 3 or 5 hours a week; also first year in the short course in Clay-working and junior year in elective courses.

392 *General Chemistry* (continued)

Freshman year, second term, lectures 2 hours, recitation 1 hour, laboratory 3 or 5 hours a week; also first year of the short course in Clay-working and junior year in elective courses.

393 *Qualitative Analysis*

Sophomore year, first term, recitation 2 hours, laboratory 10 hours a week.

Prerequisite: courses 391, 392

394 *Qualitative Analysis* (continued)

Sophomore year, second term, recitation 2 hours, laboratory 10 hours a week.

395 *Qualitative Analysis*

Sophomore year, first term, recitation 2 hours, laboratory 5 hours a week; also second year of the short course in Clay-working.

Prerequisite: courses 391, 392.

396 *Qualitative Analysis* (continued)

Sophomore year, second term, recitation 2 hours, laboratory 5 hours a week; also second year of the short course in Clay-working.

397 *Qualitative Analysis*

Junior or senior year, first term, recitation 1 hour, laboratory 5 hours a week.

Prerequisite: courses 391, 392.

398 *Qualitative Analysis* (continued)

Junior or senior year, second term, recitation 1 hour, laboratory 5 hours a week.

399 *Quantitative Analysis*

Junior or senior year, first term, recitation 1 hour, laboratory 8 hours a week.

Prerequisite: courses 393, 394, or 395, 396, or 397, 398.

400 *Quantitative Analysis* (continued)

Junior or senior year, second term, recitation 1 hour, laboratory 8 hours a week.

401 *Quantitative Analysis*

Junior year, first term, recitation 1 hour, lectures 2 hours, laboratory 10 hours a week.

Prerequisite: courses 393, 394, or 395, 396.

402 *Quantitative Analysis* (continued)

Junior year, second term, recitation 1 hour, lectures 2 hours, laboratory 18 hours a week.

403 *Quantitative Analysis, Laboratory*

Junior-senior vacation, 100 hours quantitative analytical laboratory practice.

404 *Industrial Chemistry*

Junior year, first term, 3 hours a week.

405 *Industrial Chemistry* (continued)

Junior year, second term, 4 hours a week.

406 *Industrial Chemistry, Organic*

Senior year, second term, 3 hours a week.

407 *Organic Chemistry*

Senior year, first term, recitation and lectures 3 hours, laboratory 8 or 12 hours a week.

408 *Organic Chemistry* (continued)

Senior year, second term, recitation and lectures 3 hours, laboratory 8 hours a week.

409 *Advanced Inorganic Chemistry*

Senior year, first term, lectures 2 hours, laboratory 3 hours a week.

410 *Advanced Inorganic Chemistry* (continued)

Senior year, second term, recitation 2 hours a week.

411 *Physical Chemistry*

Senior year, first term, 2 hours a week.

412 *Physical Chemistry* (continued)

Senior year, second term, 2 hours a week.

413 *Thesis*

Senior year, second term, 8 hours a week laboratory work.

The subject for thesis is chosen in any division of the department, with the approval of the instructor in charge.

GEOLOGY AND MINERALOGY

Professor J. V. LEWIS, courses 421-433

Doctor KÜMMEL, courses 421, 422

Courses in geology are supplemented by occasional excursions in the vicinity of New Brunswick and by field and laboratory study of the common rocks and their constituent minerals.

421 *General Geology*

Junior or senior year, first term, 3 hours a week.

Special emphasis is placed on the common rocks, their origin, modifications, and decay, the formation of soil, and the development of topographic forms. The course includes an outline of historical geology, with special reference to the North American continent, the leading facts in organic evolution, and a series of lectures by the State Geologist on the geology and mineral resources of New Jersey. (Cleland's *Geology*)

422 *Applied Geology*

Junior year, second term, 3 hours a week.

Dynamic, structural, and physiographic geology, with special reference to their bearing upon engineering practice; laboratory study of the common rocks, including architectural and engineering stone,

and exercises in the interpretation and use of topographic and geologic maps; lectures by the State Geologist on the geology and mineral resources of New Jersey. (Ries and Watson's *Engineering Geology*)

423 *Advanced Physical Geology*

Senior year, first term, 3 hours a week.

A comprehensive and critical study with practical work in the structural collections and field exercises in the vicinity of New Brunswick. (Chamberlin and Salisbury's *Geology*, vol. I, and parallel reading)

424 *Physiography*

Junior or senior year, second term, 3 or 4 hours a week.

Geographic features of the earth as a planet, topographic forms of the land and processes whereby they are produced and modified; physical geography of the ocean; and the nature and effects of the atmosphere. The relations of physical geography to life, and especially to man, are emphasized throughout the course. (Tarr and Martin's *College Physiography*)

425 *Economic Geology*

Senior year, second term, 3 hours a week.

A study of the chief geologic products of value including metallic and nonmetallic minerals and building stones. The course deals particularly with the economic deposits of North America with briefer reference to those of other countries for comparison. (Ries's *Economic Geology*, with lectures and collateral readings)

The three preceding courses are offered for election as alternatives, at the option of the professor, the intention being to adapt the work as far as possible to the needs of the student.

426 *Crystallography*

Junior year, first term, recitation 1 hour, laboratory 3 hours a week.

A study of the laws of crystallization with laboratory exercises in the important crystallographic groups by means of models and natural crystals and by practice in crystal drawing in the simpler modes of projection.

427 Mineralogy

Junior year, second term, recitation 1 hour, laboratory 3 hours a week.

A course intended to furnish an adequate conception of the scope of the science together with a practical acquaintance with the common minerals. It includes laboratory practice in the determination of unknown specimens and in the recognition of the more important minerals by sight. (Dana-Ford's *Manual of Mineralogy*; Lewis's *Determinative Mineralogy*)

428 Petrology

Junior or senior year, first term, laboratory 3 hours a week.

The rock-forming minerals and the various families of rocks, studied with reference to their origin, modes of occurrence, distribution, and geologic importance. (Pirsson's *Rocks and Rock Minerals*; Kemp's *Handbook of Rocks*)

429 Petrology (continued)

Junior or senior year, second term, laboratory 3 hours a week.

A laboratory study of the constitution, characters, and uses of the principal igneous, sedimentary, and metamorphic rocks, chiefly by megascopic methods.

430 Microscopic Petrography

Senior year, first term, laboratory 3 hours a week.

The petrographic microscope and the optical properties of rock-forming minerals. (Iddings's *Rock Minerals*; Rosenbusch's *Mikroskopische Physiographie*)

431 Microscopic Petrography (continued)

Senior year, second term, laboratory 3 hours a week.

Petrography of the common types of igneous, metamorphic, and sedimentary rocks.

Graduate Courses**432 Rocks and Soils**

Graduate and senior elective, first term, lectures 2 hours, laboratory 3 hours a week.

A course in the origin, classification, and chemical composition of the various types of rocks and the processes whereby these are trans-

formed into soils. The chemical changes involved are studied in detail for each class of rocks and the work with the collections is supplemented by observations in the field.

433 *Rocks and Soils*

Graduate and senior elective, second term, lectures 2 hours, laboratory 3 hours a week.

A continuation of course 432. Graduate students devote three weeks in the summer to the study of an assigned area, of which they prepare maps of both the soils and the underlying rocks.

CLAY-WORKING AND CERAMICS

Professor BROWN

Mr. GEIGER

441 *Origin and Nature of Clays*

Junior year, first term, 3 hours a week; also first year in the short course in Clay-working.

This is a study of the history of the formation of clays, their physical and chemical characteristics, the nature of the mineral impurities and of other impurities present, with their effect upon the usefulness of the clay. (Ries's *Clays, Properties, and Uses*)

442 *Winning and Preparation of Clays*

Junior year, second term, 3 hours a week; also first year of the short course in Clay-working.

This is a study of the methods and the machinery employed in the winning of clays and formation of clay wares.

443 *Ceramic Calculations*

Junior year, second term, 3 hours a week; also first year in the short course in Clay-working.

This is a course of study in the mathematical methods of solution of problems involved in the preparation of bodies and glazes as well as problems in drying and firing.

444 *Ceramic Laboratory*

Junior year, second term, 3 hours a week.

This time is devoted to the study by physical tests of various types of clays.

445 *Bodies and Glazes*

Senior year, first term, recitation 1 hour, lectures 2 hours, laboratory 10 hours a week; also second year in the short course in Clay-working, with laboratory 12 hours a week.

The time is devoted to the study of the raw materials used, the theory of the compounding of bodies and glazes, their use and faults.

446 *Bodies and Glazes* (continued)

Senior year, second term, laboratory 10 hours a week; second year in the short course in Clay-working, 12 hours a week.

447 *Thermochemical Calculations*

Senior year, first term, 3 hours a week.

The principles and methods of thermochemistry as related to the study of the combustion of fuels in gas producers, kilns, and furnaces.

448 *Thermochemical Calculations* (continued)

Senior year, second term, 3 hours a week.

449 *Driers and Kilns*

Senior year, second term, 3 hours; second year in the short course in Clay-working, recitation 4 hours, design 5 hours a week.

This is a study of the different types of driers and the various types of kilns and their construction.

450 *Physical Testing of Clays*

First year of the short course in Clay-working, first term, lectures 2 hours, laboratory 10 hours a week.

A study of the physical properties of clays used in the manufacture of crude clay wares.

451 *Physical Testing of Clays* (continued)

First year of the short course in Clay-working, second term, lectures 2 hours, laboratory 8 hours a week.

Special attention is devoted to the methods of preparation of fire-clays and the manufacture of refractories.

AGRICULTURE

Professor LIPMAN, courses 470-476, 509, 510, 512

Professor HALSTED, courses 520, 521

Professor COOK, course 509

Professor BLAKE, courses 497, 499, 500, 517, 519

Professor MINKLER, courses 478-481, 513

Professor CARSON, courses 482, 484, 486, 487, 514, 515

Professor H. R. LEWIS, courses 488, 489, 516

Professor CHIDESTER, courses 474, 475, 509, 547, 548

Professor C. B. LEWIS, course 470

Associate Professor BLAIR, courses 467-469, 511, 512

Assistant Professor APP, courses 461-465, 507, 508

Assistant Professor HELYAR, courses 466, 470

Assistant Professor FARLEY, courses 493-496, 498, 517

Mr. IRVIN, courses 488-490

Mr. SCHERMERHORN, courses 501-504, 518

Mr. RIFORD, courses 483-485

Mr. THOMPSON, courses 491, 492

Mr. HUNTER, courses 477, 479, 481

(The short courses in Agriculture begin with number 701.)

461 *Soils*

Sophomore year, first term, recitation 2 hours, laboratory 3 hours a week.

Lectures and recitations on the origin, formation, and composition of soils; the various physical and chemical characteristics of soils,

such as are correlated by the different soil classes; water holding, capillary, and hygroscopic power; soil classification; color of soils, specific gravity, texture, structure, and their crop adaptation. The laboratory practice includes exercises to illustrate the principles of capillarity, specific gravity, moisture holding capacity, and tilth of soils, together with the effect of chemicals upon structure.

462 *Soil Surveying*

Sophomore-junior vacation, 50 hours.

Plane table surveying and mapping of the different soil types. The course immediately follows the summer field practice in surveying, course 306.

463 *General Agronomy*

Sophomore year, second term, recitation 2 hours, laboratory 3 hours a week.

Field crops, their soil adaptation, fertilizer requirements, seeding, harvesting, and crop rotations; grain judging, selection of seed, and methods of seed germination.

Courses 464 and 465 are open only to those students who can show the department a satisfactory knowledge of live stock, dairy husbandry, and crops.

464 *Crops*

Senior year, first term, lectures 2 hours, laboratory 3 hours a week.

Fundamental principles of crop production and their application.

465 *Farm Management*

Senior year, second term, lectures 2 hours, laboratory 3 hours a week.

The cost, and reasons for the differences in the cost, of producing farm products in New Jersey and in the United States. Capital required for farming and its proper division on the farm, viz, buildings, machinery, stock, land, and supplies. Most efficient size of business with reasons; diversity, production, and their influence on the farmer's labor income; relation of live stock to profits; specialties, such as fruit and truck, and their proper place on the farm. **Farm**

organization, with possible visits to successful and to unsuccessful farms in the State. Methods of renting and acquiring land with the proper division between landlord and tenant in different types of farming. Labor and methods of handling economically.

466 *Seed Testing*

Senior year, second term, lecture 1 hour, laboratory 5 hours a week for three weeks.

Methods of testing agricultural seeds for purity and viability. Identification of seeds of forage plants and weed seeds commonly occurring therein.

467 *Fertilizers and Manures*

Junior year, second term, 2 hours a week.

Lectures and recitations on the history and development of scientific agriculture as bearing on present-day knowledge of soil fertility. The composition, value, and application of manures and fertilizers are considered, and theories of soil fertility discussed at length.

468 *Soil Fertility*

Senior year, first term, 2 hours, laboratory 8 hours a week.

An advanced course in soil fertility, dealing with the relation of different soils and soil types to crop production, and their modification by cropping and fertilization. Selected bulletins are assigned to the students for reading and report. The laboratory course deals with the chemical and bacteriological properties of soils. Opportunity is offered to the students to conduct vegetation experiments on soils and fertilizers.

469 *Soil Fertility* (continued)

Senior year, second term, recitation 2 hours, laboratory 8 hours a week.

A continuation of course 468.

470 *General Bacteriology*

Junior year, first term, recitation 2 hours, laboratory 3 hours a week.

This course begins with lectures on the development of bacteriology followed by a consideration of the nature and products of

bacteria. Next the subject of soil bacteria and their relation to soil fertility and crop production is considered by lectures and recitations. Finally the subject of the micro-organisms in milk and other food products is studied. The laboratory work begins with general technique, the preparation of media, rearing of cultures, mounting, staining, and methods of studying microscopic preparations. Next special studies are made in the separation and diagnosis of bacteria in milk, water, sewage, etc. (Marshall's *Microbiology*).

471 *Soil Bacteriology*

Senior year, first term, lecture 1 hour a week.

An advanced course in soil bacteriology, dealing with the relation of important species of soil bacteria to the production and transformation of plant food in soils.

472 *Soil Bacteriology* (continued)

Senior year, second term, lecture 1 hour a week.

A continuation of course 471.

473 *Soil Bacteriology*

Senior year, first term, recitation 2 hours, laboratory 3 hours a week.

Lectures, recitations, and reports on soil bacteria and other micro-organisms directly or indirectly affecting soil fertility. The more important species of soil bacteria and their physiological functions in cultivated soils are discussed at some length. In the laboratory the students are taught to isolate and to identify the common species of soil bacteria and to note the chemical changes produced by them.

474 *Soil Bacteriology*

Senior year, second term, recitation 2 hours, laboratory 3 hours a week.

A continuation of course 473.

475 *Biology of Soil Micro-organisms*

Senior year, first term, lectures 2 hours, laboratory 3 hours a week.

A study of (a) Protozoa in their relation to soil bacteria; (b) Bacteria in their relation to soil fertility; (c) Algae and fungi in their relation to soil fertility.

Development of technique and acquaintance with literature will be supplemented with the study of special problems.

476 *Biology of Soil Micro-organisms*

Senior year, second term, lectures 2 hours, laboratory 3 hours a week.

A continuation of course 475.

477 *Animal Husbandry I*

Junior year, second term, recitation 2 hours, laboratory 3 hours a week.

A study of types and market classes of live stock, including horses, beef cattle, sheep, and swine with special reference to feeding and management problems involved in the care and maintenance of animals found on the general farm. The laboratory work includes score card and practice in scoring and placing market classes of animals.

478 *Animal Husbandry II*

Senior year, first term, recitation 1 hour a week.

A study in the production of animals and their products. The source, composition, feeding and market value of the various feed stuffs used for feeding farm animals. Methods and practices of feeding, and the compounding of rations. Maintenance requirements. Determination of the economic worth of end products.

479 *Animal Husbandry III*

Senior year, first term, recitation 1 hour, laboratory 3 hours a week.

A study of breeds of live stock, including horses, beef cattle, sheep, and swine; their origin, history, distribution, development, and comparative worth. The laboratory work includes exercises in live stock management and the judging and identification of the breeds studied.

480 *Animal Husbandry IV*

Senior year, second term, recitation 1 hour a week.

Advanced work in feeds and feedings. Animal nutrition and metabolism. The comparative digestibility, palatability, and economic value and sources of various commercial feeding stuffs. Compilation of experimental feeding data from bulletins and reports of Experiment Stations. Bibliography of literature relating to animal feeding.

481 *Animal Husbandry V*

Senior year, second term, recitation 1 hour, laboratory 3 hours a week.

Animal breeding and live stock management. A study of the fundamental laws of breeding, production, and reproduction; the tabulation of pedigrees from stud and herd books; a study of the leading families representative of the various breeds, including methods and achievements of individual breeders. The laboratory work includes exercises in advanced judging, the visitation of leading flocks, studs, and herds in the vicinity; also the study of show yard rules and requirements. The essentials involved in stud, herd, and flock management with special references and assigned practical problems.

Animal Breeding—See courses 547, 548.

482 *Dairy Husbandry I*

Sophomore year, second term, lecture 1 hour, laboratory 3 hours a week.

Secretion of milk; composition and physical properties of milk; the use of the Babcock test in testing milk and its products; caring for milk on the farm; ferments in milk and their control; creaming milk at the farm by gravity and centrifugal methods; ripening and churning cream; marketing milk, butter, and other dairy products; value of by-products of the dairy; town and city milk and cream trade; dairy stables; feeding and management of the dairy herd; advantages of cooperative dairying; methods of paying for milk and cream; a general knowledge of the problems connected with milk production.

Laboratory includes practice in the use of the Babcock test and of hand-separators; cream ripening and making and preparing butter for market; with work in judging dairy cattle.

483 *Dairy Husbandry II*

Senior year, first term, lectures 2 hours, laboratory 3 hours a week.

Milk Production.—Breeds of dairy cattle; selection, breeding, and development of a dairy herd; care and management of dairy cattle; feeding for milk production; the problems connected with the economic production of market milk.

Laboratory includes advanced work in judging dairy cattle.

484 Dairy Husbandry III

Senior year, first term, lecture 1 hour, laboratory 5 hours a week.

Dairy Bacteriology.—Structure of bacteria and conditions governing their development and distribution; methods of studying bacteria; contamination of milk; relation of bacteria to milk, butter, cheese, etc.; fermentations of milk and their control; pasteurization of milk, cream, skim milk, and whey; efficiency of the various makes of pasteurizers; principles of refrigeration.

Dairy Chemistry.—A study of the chemical properties of milk; tests for preservatives and adulterations; chemical analysis of milk and its products.

485 Dairy Husbandry IV

Senior year, second term, lectures 2 hours, laboratory 3 hours a week.

Market Milk.—A study of the value of milk as a food; production and handling of market milk, of certified and modified milk; and commercial milk inspection.

Laboratory includes analysis of milk and the determination of adulterations, market milk inspection, and the scoring of dairy barns.

486 Dairy Husbandry V

Senior year, second term, lecture 1 hour, laboratory 2 hours a week.

Dairy Manufactures.—Lectures and laboratory on the manufacture of butter, cheese, and other milk products.

487 Dairy Husbandry VI

Senior year, second term, lecture 1 hour a week.

Special Production Problems.—A discussion of special problems in connection with the production of milk; breeding; feeding; animal nutrition and metabolism; and diseases common to dairy cows. Intended to give an insight into present day investigational work.

488 Poultry Husbandry I

Sophomore year, second term, recitation 1 hour, laboratory 3 hours a week.

A general course showing the requirements and possibilities of the poultry industry. Poultry farming and what it means; poultry eco-

nomics; factors governing the location and situation of the poultry plant; breeds of poultry; design and construction of houses, their equipment and fencing; poultry feeds and feeding; principles of poultry breeding; management of laying and breeding stock; natural and artificial incubation and brooding; broilers, roasters, and capons; fattening, killing, and dressing; marketing poultry products; poultry records, accounts, and advertising; exhibition, scoring, and judging; parasites, diseases, and enemies.

489 *Poultry Husbandry II*

Senior year, first term, recitation 3 hours, laboratory 8 hours a week.

Types and Breeds.—Methods of exhibition, scoring, and judging; origin, history, characteristics, and classification of the common breeds of poultry; commercial meat and egg types; methods and organization in conducting poultry shows; preparing poultry and poultry products for exhibition; poultry dictionary and definition of terms; use of score cards for live and dressed poultry and eggs; turkeys, geese, and wild fowl.

Housing.—Selecting the site; location and layout of poultry houses; materials for construction; principles of poultry house construction; interior arrangement; types of houses, cost of construction; auxiliary buildings and fences.

Feeding.—Composition of feeds; physiology of nutrition; food nutrients, their use and sources; composition and adaptability of feeding stuffs; classification of feeds; analysis, adulteration, and inspection of feeds; home-grown feeds; ready-mixed feeds; balancing rations and estimating costs; rations for special purposes.

490 *Poultry Husbandry III*

Senior year, second term, recitation 3 hours, laboratory 8 hours a week.

Poultry Products.—Money crops from the poultry flock; preparation of poultry products; killing, picking, dressing, and packing; handling of market eggs; candling; caponizing; poultry markets, wholesale and retail; fixing prices and securing trade.

Hatching and Rearing.—The hatching egg, its production and handling; its composition and function; natural incubation and brooding; artificial incubation and brooding; rearing; rearing appliances.

Poultry Farm Management.—Organizing the business, financing the enterprise; records, accounts, advertising; types of poultry farms and combinations; broiler, roaster, and capon farms; labor problems; capital; business administration.

491 *Poultry Pathology I*

Senior year, first term, lectures 2 hours, laboratory 3 hours a week.

Sanitation as a factor in poultry keeping; the problems of sanitation, sanitary methods, and general prevention methods of poultry diseases, together with a full discussion of the best, most economical, practicable, sanitary principles; common poultry diseases, their symptoms, cause, prevention, treatment, and control; anatomy of healthy fowls and diagnosis of diseased specimens; specific diagnosis of all classes of troubles. The course deals with every phase of this important limiting factor in poultry breeding.

492 *Poultry Pathology II*

Senior year, second term, lectures 2 hours, laboratory 3 hours a week.

A continuation of course 491.

493 *Plant Propagation*

Junior year, first term, recitation 2 hours, laboratory 3 hours a week.

The principles and methods of plant propagation are studied in detail—propagation by seeds; by separation and division of bulbs, corms, tubers, and rootstocks; by cutting; by layerage; and by budding and grafting. Modern methods of nursery practice.

494 *Practical Pomology I*

Junior year, second term, recitation 3 hours, laboratory 3 hours a week.

A general study of the culture of the common deciduous fruits, such as apples, pears, peaches, plums, cherries, and quinces; soils, climate, varieties, fertilization, cultivation, spraying, and pruning. Selection of nursery stock and the establishment of orchards. Field and laboratory exercises in the laying out and planting of orchards; pruning of fruit trees, shrubs, and vines; preparation of spray mixtures and use of spraying machinery.

495 *Commercial Pomology*

Senior year, first term, recitation 1 hour, laboratory 3 hours a week.

A study of the picking, grading, packing, storing, and marketing of fruits, including a discussion of storage houses, commercial fruit packages, markets, and methods of marketing. Particular emphasis is placed on field and laboratory work, together with special trips made to commercial orchards, storage houses, and large markets.

496 *Systematic Pomology*

Senior year, first term, laboratory 5 hours a week.

A detailed study of the characters of some of the standard varieties of fruits with special attention to variations in the form, vigor, and habit of growth of the tree and in the form, color, and flavor of the fruit. This lays the foundation for special work in fruit scoring and judging.

497 *Horticultural Literature*

Senior year, first term, 2 hours a week.

Sources of horticultural information; government and station publications; abstracts of bulletins and magazine articles.

498 *Practical Pomology II*

Senior year, second term, recitation 1 hour, laboratory 3 hours a week.

A study of the culture of the common small fruits, such as currants, gooseberries, blackberries, raspberries, and strawberries. Grape culture with methods of pruning and training. Special problems in connection with the general principles discussed in course 494.

499 *Horticultural Seminar*

Senior year, second term, 2 hours a week.

Advanced study upon questions pertaining to practical commercial, and systematic pomology. Reports and discussions on special topics.

500 *Plant Breeding*

Senior year, second term, recitation 2 hours, laboratory 2 hours a week.

A brief study of the elements of plant breeding with particular attention to horticultural crops.

501 *Olericulture or Market Gardening I*

Senior year, first term, recitation 3 hours, laboratory 8 hours a week.

Selection of varieties, crop management, harvesting, storage, and marketing. Vegetable forcing. Systematic vegetable description, classification, and nomenclature. Cold frame management. Details of selection and preparation of soil and a thorough study of the culture of the various vegetable crops.

502 *Olericulture or Market Gardening II*

Senior year, second term, recitation 3 hours, laboratory 8 hours a week.

A continuation of course 501. Vegetable forcing. Hotbed construction and management; growing of vegetable plants for transplanting into the field. Planning of rotations, companion cropping and succession cropping systems. Use of seed drills and cultivators; actual practice in vegetable growing in the field by assignment of individual plots.

503 *Olericulture or Market Gardening III*

Senior year, first term, recitation 2 hours, laboratory 3 hours a week.

A thorough study of the culture of the various vegetable crops. Systematic studies of varieties. Forcing vegetables in the greenhouse. Details of selection and preparation of soil; time and methods of planting; methods of harvesting and marketing. Practical exercises in the sowing of vegetable seeds and transplanting of plants.

504 *Olericulture or Market Gardening IV*

Senior year, second term, recitation 2 hours, laboratory 3 hours a week.

Practical exercises in construction and management of hotbeds and cold frames. Succession and companion cropping systems. Actual practices in vegetable growing in the field by assignment of individual plots.

505 *Research Thesis*

Senior year, first term, laboratory 5 hours a week.

The work of this course consists of the study of some special agricultural problem. The students are given opportunity to acquire proficiency in advanced laboratory technique and to familiarize themselves with the literature on their particular problem.

506 *Research Thesis*

Senior year, second term, laboratory 5 hours a week.

A continuation of 505.

Graduate Courses**507 *Farm Crops***

Open to those who are prepared to take advanced crop work. The course deals with the so-called principles of crops and covers the subject in a comprehensive way. All students registering in this department are required to attend the seminars.

508 *Farm Management*

Prerequisites: courses in horticulture, crops, animal husbandry, and dairy husbandry, the equivalent of the undergraduate courses offered in this field. Cost accounting, farm organization, and farm surveys constitute the major portion of the advanced work, together with a study of efficiency factors as affected by different methods of farming and types of farms. Attendance at seminars is required.

509 *Microbiology of Soils*

Lectures, seminars, field and laboratory research. The isolation and study of bacteria, fungi, and protozoa prominent in cultivated soils.

510 *Soil Bacteriology*

Lectures, seminars, and laboratory research. The study of the morphology and physiology of the important groups of soil bacteria; their relation to soil fertility and crop production.

511 *Soil Chemistry*

Lectures, seminars, and laboratory research. The study of the methods of soil analysis, particularly of those devised for determining the inorganic constituents of soils. The chemistry of soil solution and its modification by tillage and fertilization.

512 *Soil Fertility*

Lectures, seminars, laboratory research, field and pot experiments. The accumulation, transformation, and losses of plant-food in soils. Tillage, drainage, liming, fertilization, and manuring as factors in soil fertility.

513 *Advanced Animal Husbandry*

Assigned problems in pork production and in the marketing of animal husbandry products. Complete facilities for investigational and research work on problems in swine feeding. Provision is also made for the gathering of data relative to the intensity of live stock production and marketing in the State.

514 *Advanced Dairy Husbandry*

Lectures and laboratory work. A study of bacteria and their relation to the production of milk, cream, butter, and cheese; the chemical properties and changes in milk, its products, and by-products; the various breeds of dairy cows; the feeding and management of a dairy herd and a comparison of rations suitable for the production of milk; the diseases and ailments common to the dairy herd.

515 *Research Thesis in Dairy Husbandry*

The subject of the thesis is chosen by the student and approved by the professor under whose direction it is prepared.

516 *Advanced Poultry Husbandry*

Special research in poultry breeding, poultry feeding, incubation, and poultry management, these subjects being offered as major problems only.

517 *Pomology and Small Fruits*

Many problems in connection with peach and small fruit production are studied.

518 *Olericulture*

Various problems in growing vegetables, particularly the tomato, eggplant, pepper, and sweet potato.

519 *Floriculture*

Advanced study of forcing roses, carnations, and other greenhouse plants. A special range of greenhouses is available for investigational work.

520 *Plant Physiology*

Advanced studies connected with the research work under the project of toxicology in the college experiment station, chiefly in a greenhouse with potted plants. The characteristic poisonous effects of various salts more or less related to commercial fertilizers and to sick soils are observed and recorded.

521 *Plant Breeding*

Advanced studies of a practical nature in connection with the researches being prosecuted at the college experiment station. Four acres are largely devoted to breeding, chiefly in the groups of plants known as vegetable fruits, such as beans, corn, eggplants, peppers, and tomatoes. Greenhouses are also available to students during the winter.

PHYSIOLOGY

Professor MOORE

531 *General Physiology*

Junior year, first term, lectures 3 hours, laboratory 5 hours a week.

Nerve muscle physiology, circulation, and respiration. (Howell's *Textbook of Physiology*)

532 *General Physiology*

Junior year, second term, lectures 3 hours, laboratory 5 hours a week.

Physiology of digestion, secretion, and excretion; central nervous system and special senses.

533 *Biochemistry*

Senior year, first term, lectures 3 hours, laboratory 5 hours a week.

Tests for and quantitative determination of carbohydrates, fats, and proteins; physiology of inorganic salts.

534 *Biochemistry*

Senior year, second term, lectures 3 hours, laboratory 5 hours a week.

Preparation of cell lipins, proteins, and enzymes; analysis of blood and urine.

Graduate Courses**535 *Research in Physiology***

Lectures, conferences, and laboratory exercises.

Credit in this course is given for work done at the Woods Hole Marine Biological Laboratory.

536 *Research in Biochemistry*

Lectures, conferences, and laboratory exercises.

ZOOLOGY

Professor CHIDESTER

Mr. ASHMAN

541 *General Zoology—Invertebrates*

Sophomore or junior year, first term, lectures 2 hours, laboratory 3 hours a week.

This is an introductory course and is prerequisite to courses in anatomy or physiology. Special emphasis is laid upon forms economically important. (Hegner's *College Zoology*)

542 *General Zoology—Vertebrates*

Sophomore or junior year, second term, lectures 2 hours, laboratory 3 hours a week.

In addition to the dissection of an amphibian, a bird, and a mammal, the elements of histology and embryology are included. (Hegner's *College Zoology*)

543 *Vertebrate Anatomy*

Junior year, first term, lecture 1 hour, laboratory 3 or 5 hours a week.

The comparative anatomy of fishes, amphibians, and reptiles follows a critical examination of various theories of the origin of vertebrates. Several lectures on vertebrate paleontology are interspersed. (Parker and Haswell, Wiedersheim, Kingsley)

544 *Vertebrate Anatomy* (continued)

Junior year, second term, lectures 2 hours, laboratory 3 or 5 hours a week.

The warm-blooded vertebrates are thoroughly studied, especial attention being given to the zoological history of the human body. This course may be taken independently of the first term's work by those who are properly qualified.

545 *Histology*

Senior year, first term, recitation or lectures 2 hours, laboratory 5 hours a week.

This course comprises the study of the microscopic anatomy of the vertebrate body, with methods of histological technique. (Schäfer, Lewis, Bailey; reference books on technique—Guyer, Hardesty, Lee)

546 *Embryology*

Senior year, second term, recitation or lectures 2 hours, laboratory 5 hours a week.

This is a course in comparative vertebrate embryology, including the development of the frog, chick, and pig. Special methods are introduced. (Prentiss, Kellicott, Lillie, Keibel-Mall)

547 *Animal Breeding*

Senior year, first term, lectures 2 hours, laboratory 3 hours a week.

A course in genetics and experimental embryology which includes a careful study of the literature on heredity, with laboratory experiments on insects, birds, and mammals. (Walter's *Genetics*)

548 *Animal Breeding*

Senior year, second term, lectures 2 hours, laboratory 3 hours a week.

A continuation of course 547.

Graduate Courses**549 *Research in Histology***

Lectures, conferences, and laboratory work.

Investigation of special problems in normal and pathological histology.

550 *Research in Embryology*

Lectures, conferences, and laboratory work.

Normal and experimental embryology.

Credit in this course is given for work done at the Woods Hole Marine Biological Laboratory.

BOTANY AND PLANT PATHOLOGY

Professor COOK, courses 561-571

Assistant Professor HELYAR, courses 565-571.

561 *General Botany*

Sophomore or junior year, first term, recitation 2 hours, laboratory 3 hours a week.

A general survey of the plant kingdom, using types of the various groups of plants for demonstrating the fundamentals of plant structure, physiology, and reproduction. Both living and preserved materials are used in this course. (Curtis's *Nature and Development of Plants*)

562 *General Botany*

Senior year, first term, recitation 2 hours, laboratory 5 hours a week.

This course is essentially the same as the preceding plus some training in technique.

563 *Plant Morphology and Physiology*

Sophomore or junior year, second term, recitation 2 hours, laboratory 3 hours a week.

A study of the morphological characters of the higher plants, followed by a brief study of the physiology of plant life. Special attention is given to the laboratory experiments in plant physiology and to the conditions necessary for the growing of plants. (Duggar's *Plant Physiology*)

564 *Plant Morphology and Physiology*

Senior year, second term, recitation 2 hours, laboratory 5 hours a week.

This course is similar to the preceding but more extensive.

565 *Plant Pathology*

Junior year, first term, recitation 1 hour, laboratory 3 hours a week.

A brief history of the causal factors and symptoms of plant diseases. The making of fungicides and the principles of the treatment of plant diseases. (Duggar's *Fungus Diseases of Plants*; Stevens and Hall's *Diseases of Economic Plants*)

566 *Plant Pathology*

Senior year, first term, recitation 2 hours, laboratory 3 hours a week.

Microtechnique, morphology of parasitic fungi; histology of pathologic tissues, methods of inoculation, classification and life history of economic fungi. (Steven's *Fungi which cause Plant Diseases*; assigned reading)

567 *Plant Pathology*

Senior year, second term, recitation 2 hours, laboratory 3 hours a week.

A continuation of course 566.

Graduate Courses

Graduate students in this department are expected to do certain assigned reading and to meet at least one hour a week for the review of current literature on botanical subjects.

568 *Advanced Plant Pathology*

Lectures and laboratory work. Studies on the life history and morphology of organisms causing disease; the symptoms and treatments of diseases.

569 *Advanced Plant Pathology*

Lectures and laboratory work. A course in microtechnique of fungi and diseased plant tissues.

570 *Advanced Plant Pathology*

Laboratory research. Work on an assigned problem.

571 *Advanced Plant Pathology*

Seminar 1 hour a week.

ENTOMOLOGY

Professor HEADLEE, courses 581, 582, 584, 586-588

Dr. PETERSON, 583, 585, 587, 589

581 *General Entomology*

Junior year, second term, recitation 2 hours, laboratory 3 hours a week.

A course covering the general anatomy and physiology of insects with special reference to those characters that bear upon their relations to other animals and plants. The lectures and book work are arranged with special reference to the ways in which insect life affects human welfare. In the laboratory the general structure is studied by means of dissections, and the physiology by the breeding of two species throughout their entire life cycle. The relation of insect life to the plant kingdom is illustrated by a study of greenhouse plant lice, and the relation

to animal life by the study of the mosquitoes in relation to man. The systematic arrangement of the insect world is studied by means of practice in classification.

582 *Economic Entomology*

Senior year, first term, recitation 3 hours, laboratory 8 hours a week.

This is a direct study of the bearing of the insect world on human welfare and consists of lectures and recitations on recognition marks, life history and habits, and methods of controlling: (1) the most important of the species attacking man himself, his crops, and his domestic animals; (2) the most important of the beneficial species.

In the laboratory work the student is given familiarity with the recognition marks by practice in classification of economically important species and of characteristic specimens of their work, with life history and habits by field trips and practical insect breeding, with methods of control by experimental tests of the value of typical insecticides and a special field study by each student of one large economic problem, such as the handling of a swarm of bees, the control of the codling moth, the control of the mosquito or the control of the house fly.

583 *Taxonomic Entomology*

Senior year, second term, recitation 3 hours, laboratory 8 hours a week for agricultural students; recitation 2 hours, laboratory 5 hours a week for those who have taken elective course 586.

Lectures and student reports on the characteristics of the main groups and subgroups of insects, methods and ends of classification, and taxonomic literature and how to use it. The student is expected to classify a group of insects representing all orders to the family, and a group representing a single order to the species. He is expected to make a collection of the local species representing a given small group and to prepare these specimens properly for museum purposes.

584 *Economic Entomology*

Senior year, first term, recitation 2 hours, laboratory 3 hours a week.

An abbreviated form of 582 with emphasis upon the groups of insects injurious to the organisms treated in that major course.

585 *Taxonomic Entomology*

Senior year, second term, recitation 2 hours, laboratory 3 hours a week.

An abbreviated form of course 583.

586 *Medical Entomology*

Junior year, second term, recitation 2 hours, laboratory 3 hours a week.

In this course the student is expected to become familiar with the principal insects that carry disease, the methods employed by them in this work, and the ways in which their work may be prevented.

Graduate Courses

587 *Taxonomic Entomology*

Intended for students with sufficient preparation and experience to undertake a more or less independent study of the fundamental principles of insect classification. The student is expected to master the classification of a limited group of insects in such a fashion that at least a part of his results will form a contribution to knowledge.

588 *Economic Entomology*

Designed for students with sufficient preparation and experience to pursue a more or less independent study of some phase of the relationship which insects bear to men. A part of the results of this study is expected to form a contribution to knowledge.

589 *Morphology and Development*

In this course the student is expected to become familiar with the general principles of insect structure and development and to pursue a detailed study of some specific phase of structure or development.

MILITARY SCIENCE AND TACTICS

Captain LEASURE

First Sergeant WHITE

Sergeant SIEBERT

Sergeant ERLANDER

The purpose of the instruction in this department is not only to give military training that shall fit young men to render efficient and intelligent service to their country in time of war but also to spread among the citizens of the State a thorough and accurate knowledge of our military history, policy, and necessities.

The endeavor is to inculcate habits of discipline, obedience, loyalty, self-control, order, and precision.

Military training improves the health and physique through the habit of erect carriage, alert movement, and a certain amount of incidental physical exercise. The student learns also what should be done in case of injury, how to prevent disease and otherwise preserve his health in camp and wherever else sanitary precautions are necessary.

The military instruction meets the requirements of the laws of Congress for the state colleges organized under the act of July 2, 1862, and also of the National Defense Act of June 3, 1916, establishing units of the "Reserve Officers' Training Corps."

The War Department details an officer of the Regular Army as Professor of Military Science and Tactics and non-commissioned officers, also of the Regular Army, as assistants.

The course in Military Science and Tactics qualifies the student who completes it: (1) for appointment in the "Officers' Reserve Corps"; (2) for appointment as temporary second lieutenant in the Regular Army for further training; (3) for further appointment to permanent commissions in the Regular Army.

The course is required of all freshmen and sophomores, except those excused on certificates of physical disability or by reason of conscientious scruples. It is elective in the junior and senior years.

Military scholarships amounting to about \$9 a month are granted by the United States, under certain conditions, to students electing the course in the junior and senior years.

Free transportation, uniforms, and subsistence are offered by the United States to all students who elect to attend summer training camps.

The uniform adopted is the olive drab, similar to that of officers of the Regular Army.

The United States provides the latest models of rifles and equipments, and, probably beginning in 1917, will furnish complete service uniforms for the use of students while they are undergoing military instruction.

The Corps of Cadets is organized into a battalion of four companies of infantry and a band.

Instruction in this department is both theoretical and practical, the former being designated as Military Science and the latter as Military Tactics.

A progressive program of practical training is carried out, as follows: Military discipline; military courtesy; military deportment; school of the soldier; school of the squad; school of the battalion; ceremonies and inspections; nomenclature and management of the rifle; sighting drills; position and aiming drills; deflection and elevation correction drills; gallery target practice; range target practice; bayonet exercises and bayonet fencing; guard duty; signaling; map reading; road and area sketching; construction and location of intrenchments and obstacles; musketry fire control and direction; target designation and distribution; camping and field sanitation; first aid to the injured; field engineering; preparation of field messages and field orders; marches and camps; patrolling; advance guards; flank guards; rear guards; outposts; attack and defense; tactical walks; terrain exercises; map problems; map maneuvers; field maneuvers.

The theoretical instruction consists of textbook study and recitations, demonstrations, and lectures, covering the practical work above outlined and the following: Company administration; personal hygiene; combat principles, offensive and defensive; leadership; reconnaissance; attack and defense of positions; meeting engagements; withdrawal from action; machine guns; ammunition supply; mounted scouts; night operations; infantry against cavalry; infantry against artillery; minor tactics; theory of rifle shooting; combat collective firing; effects of collective fire; influence of the ground; adjustment of collective fire; targets and ranges; mobilization and concentration; transportation of troops and matériel; supply service; ammunition service; sanitary service; engineer service; marches and convoys; transmission of information, field telegraph and telephone lines; aeroplanes and balloons; rules of land warfare; hasty intrenchments; field fortifications; cordage and spars; spar bridges; floating bridges; roads and railroads; demolitions; camping expedients; military history of

the United States; military policy of the United States; lessons from European wars; military law; international law; psychology of war; organization of modern armies; land forces of the United States; functions of the different arms,—infantry, cavalry, artillery, engineers, signal corps.

601 *Military Tactics*

Freshman and sophomore years, 3 hours a week, required for students in all courses.

602 *Military Science and Tactics*

Junior year, 5 or 6 hours a week, elective for students in all courses.
Includes functioning as cadet non-commissioned officer.

603 *Military Science and Tactics*

Senior year, 5 or 6 hours a week, elective for students in all courses.
Includes functioning as cadet officer or non-commissioned officer.

PHYSICAL TRAINING

Professor DODGE

Mr. REILLY

Mr. HAZEL

Opportunities for physical training are afforded to all students by the Robert F. Ballantine Gymnasium and Neilson Field, which are elsewhere described.

At the beginning of the freshman year each student is given a physical examination and a complete record is made of his physical condition. This examination is repeated from time to time and the record thus furnishes valuable information concerning the growth and development of the individual.

Swimming is required during both terms. Freshmen who fail to attain satisfactory proficiency before May first lose their class standing.

Apart from swimming, athletic and gymnastic work is regularly optional for all students. However, it is required of those freshmen and sophomores who, for any reason, do not take military science,

special corrective exercises in gymnastics being prescribed for such as are excused from the military course on account of physical disability.

Those not members of the college teams are provided with facilities for track work, football, baseball, soccer, and tennis.

Classes are formed during the winter in light and heavy gymnastics, boxing, wrestling, and fencing, and a progressive system of instruction is followed.

611 *Athletics and Gymnastics*

Sophomore year, first term, 4 half-hour periods a week, required of all students not taking military science.

Track work or football during the first part of the term and fencing, boxing, or basket-ball during the second part.

612 *Gymnastics and Athletics*

Sophomore year, second term, 4 half-hour periods a week, required of all students not taking military science.

Fencing, boxing, or basket-ball during the first part of the term and track work or baseball during the second part.

HYGIENE

Professor C. B. LEWIS

621 *Hygiene*

Freshman year, first term, 1 hour a week.

A course dealing with the development of good health habits. Influence of abnormal conditions and habits on health; carriers of disease; causes and nature of disease; ways and means of securing and conserving health. (Pyle's *Personal Hygiene*)

622 *Hygiene*

Freshman year, second term, 1 hour a week.

A continuation of course 621.

Health Supervision

The health of students is under the care of the College Physician, who gives nearly all his time to the practice of preventive medicine with the teaching of efficient living. Daily office hours are held for consultation and every student may obtain advice upon all matters pertaining to his health.

Early in the fall a complete medical examination is made of all entering students by the College Physician. Subsequent examinations are given at suitable intervals.

All candidates for athletic teams are required to pass an examination declaring them physically fit for competition.

THESIS

631 *Graduation Thesis*

During the senior year each member of the graduating class is required to prepare a thesis on some subject approved by the professor or professors in charge of his elective course or courses. The thesis must be acceptable to the professor under whose direction it has been prepared and the author is required to submit two typewritten copies on the prescribed paper and suitable in all respects for binding and for permanent preservation in the College Library and in the department files.

The subject must be submitted to the college office on or before the first day of the second term and the completed thesis not later than the last Friday in May.

Every senior whose work in preparation of the graduation thesis is not provided for in the regular schedule, is required: (1) to submit to the college office not later than four weeks after the beginning of the second term a written report of work done toward the preparation of his thesis; and (2) to report to the professor concerned for weekly conference thereafter at such time as the professor may appoint, until the thesis has been completed and accepted.

SHORT COURSES IN AGRICULTURE**Officers of Administration**

W. H. S. DEMAREST, LL.D., *President of the College*

JACOB G. LIPMAN, PH.D., *Dean of Agriculture*

FREDERICK C. MINKLER, B.S.A., *Director of the Short Courses in Agriculture*

Teaching Staff

JACOB G. LIPMAN, Ph.D., Soil Fertility and Fertilizers

FREDERICK C. MINKLER, B.S.A., Animal Husbandry

MAURICE A. BLAKE, B.S., Horticulture

HARRY R. LEWIS, M.Agr., Poultry Husbandry

THOMAS J. HEADLEE, Ph.D., Entomology and Bee Husbandry

MELVILLE T. COOK, Ph.D., Plant Pathology

ARTHUR J. FARLEY, B.S., Fruit Growing

FRANK APP, B.S., Agronomy and Farm Management

JOHN P. HELYAR, M.S., Seed Testing

LYMAN G. SCHERMERHORN, B.Sc., Vegetable Gardening

A. H. HOFFMAN, B.S., A.M., Agricultural Engineering and Farm
Machines

WILLARD C. THOMPSON, B.S., Poultry Diseases

WILLIAM J. CARSON, B.S.A., Dairy Husbandry

DOROTHY M. HOPE, B.S., Domestic Science and Art

LOYD S. RIFORD, B.S., A.M., Dairy Production

J. MARSHALL HUNTER, B.S., Animal Production and Judging

ROY F. IRVIN, B.S., Poultry Production and Judging

ALVAH PETERSON, Ph.D., Economic Entomology.

E. LEON LOBLEIN, V.S., Veterinary Science

J. ALLEN RIDGWAY, Carpentry

JAMES W. DAY, A.M., Assistant in Agronomy

CHARLES S. VAN NUIS, Farm Machinery

EMILY POWELL LEEDS, Assistant in Home Economics

RALSTON RAYMOND HANNAS, B.S., Laboratory Assistant

RALPH MOORE HUBBARD, B.S., Laboratory Assistant

CLARA M. CHANDLER, Secretary

As outlined on pages 90 and 91, five courses of study are offered embodying subject matter as follows:

- Course I General Agriculture and Dairy Farming
- Course II Fruit Growing and Market Gardening
- Course III Poultry Husbandry
- Course IV Home Economics
- Course V Bee Husbandry

The courses are offered for men and women interested in agriculture and home making, who are willing to invest their best efforts and work diligently for the cause of better agriculture and the improvement of the farm home. Tuition is free to residents of the State; nonresidents are also received upon payment of a fee of twenty-five dollars (\$25.00); all pay a registration fee of five dollars (\$5.00) upon acceptance of their application for admission.

Entrance examinations are not required for admission, but candidates should be at least seventeen years of age and show credentials evidencing a common school education. Graduates of high schools who have had at least two years practical work on the farm are well qualified for the work. Farm boys and girls with more experience and perhaps less actual schooling are able to pursue the work with great credit to themselves.

Courses I, II, III, V are open to men and women alike, and each requires the full twelve weeks for its completion. Course IV is planned exclusively for women. Satisfactory completion of any one of the courses entitles the student to a certificate awarded by the College.

The courses open on November 19, 1917, and close February 20, 1918. Correspondence concerning them should be addressed to Professor Frederick C. Minkler, Director of the Short Courses in Agriculture, New Brunswick, New Jersey.

Course I General Agriculture and Dairy Farming

Summary: recitation and lectures 18 hours, laboratory 20 hours a week.

701 Soils and Fertilizers

Lectures 2 hours a week.

Origin, formation, and types of soils. Their chemical and physical properties as related to soil fertility. Classification of soil types in their relation to production. Practice of tillage and methods of con-

serving soil moisture. Green manure and cover crops, including studies of soil bacteriology as related to plant growth. The essential elements of plant food, their source, carriers, composition, and character. Comparison of home mixtures and manufactured fertilizers.

Liming.—Sources, kinds, relative values, purchase, and application.

702 *Animal Production and Feeding*

Lectures 2 hours a week.

A study of the production of market types and classes of horses, beef cattle, sheep, and swine. Systems of breeding, management, feeding, and marketing live stock and their products. Source, composition, feeding value, and adaptability of the various feed stuffs utilized in the feeding of farm animals. Compounding of rations for growing, breeding, working, and fattening animals, including the comparative feeding value, digestibility, palatability, and economy of various grains, concentrates, and roughage available for feeding purposes.

703 *Animal Husbandry*

Lectures 2 hours, laboratory 2 hours a week.

A study of the various breeds and types of live stock and their adaptability for particular farm conditions. Methods and practices of breeding, selection, and mating. The care and management of breeding animals. The feeding of young growing or fattening animals. The relative importance of various systems of breeding, selection, and management.

704 *Agronomy*

Lectures 2 hours, laboratory 2 hours a week.

A study of types and varieties of grains and other field and forage crops. Field practices and crop rotations. Judging of grains with the comparison of yields, seeding dates, and ripening periods. Seed corn selection. Testing for germination, vitality, and purity. Storage of seed corn and other grains intended for planting.

705 *Dairy Manufactures*

Lectures 2 hours, laboratory 2 hours a week.

A study of milk and its products. Its composition and food value. Determination of butter fat and specific gravity tests of milk and

cream. Cream separators, their use and comparative value. The handling of market milk, certified milk, and modified milk. Detecting of acidity and adulterations. Approved methods of weighing and sampling milk and cream. Pasteurization of milk. Ripening of cream. The use of starters, with some practice in the use of other dairy machinery as related to home butter making. The handling of market milk; cooling, bottling, and methods of distribution. Judging and scoring of dairy barns and milk houses. Advanced registry testing. The importance and value of cow testing associations as related to dairy production.

706 *Dairy Production*

Lectures 2 hours, laboratory 2 hours a week.

A study of breeds and types of dairy animals. Selection of dairy cows based upon individuality and evidences of usefulness. Herd management involving selection of dairy sires and the growing of young stock. Practices of mating and selection. Compounding of rations for economical production. Stabling. Systems of ventilation. Common ailments of dairy cattle with the discussion of farm problems from a dairyman's standpoint. Judging dairy cattle.

707 *General Economic Entomology*

Lecture 1 hour a week.

A series of illustrative lectures on the principal insects injurious and beneficial to farm crops and to farm animals, and the most successful methods of controlling their work. A reasonable consideration is given the insects that influence human health on the farm.

708 *Poultry Husbandry*

Lecture 1 hour a week.

Poultry farming and what it means. Factors governing the location and situation of the poultry plant. The breeds of poultry. Design and construction of houses, their equipment and fencing. Poultry feeds and feeding. Principles of poultry breeding. Management of laying and breeding stock. Natural and artificial incubation and brooding. Broilers, roasters, and capons. Fattening, killing, and dressing. Marketing poultry products. Poultry records, accounts, and advertising. Exhibition, scoring, and judging. Parasites, diseases, and enemies.

709 Practical Fruit Growing

Lecture 1 hour a week.

A few of the important principles of fruit culture with definite facts as to orchard management. Practices and principles of the establishment of orchards, pruning, spraying, and fertilization. The aim is to give the student interested in general farming specific knowledge of the fruit industry of the State.

710 Agricultural Engineering

Lectures 2 hours, laboratory 8 hours, a week.

Types and methods of construction of various farm buildings. The construction and value of the various types of the silo. Heat, light, and the problems of water supply. A study of farm tractors, gasoline, and steam engines and various agricultural implements. Systems of ventilation. Sewage disposal plants. Practical shop practice and bench work. Pipe fitting with forge practices. The use and value of concrete construction. Practical work in the building of colony, swine, and poultry houses.

711 Seed Testing and Identification

Laboratory 2 hours a week.

Exercises in identifying and testing seeds. Detecting methods and practices of adulteration. Testing for vitality and germination. Special attention is given to the identification of grass and weed seeds with suggestions as to the best means of eradication.

712 Farm Management

Lecture 1 hour a week.

The choosing of a farm. Intensive and extensive schemes of farming. Diversified and specialized farming. Relation of live stock to the farm business. Relation of the size of the farm to its efficiency. Farm capital and its distribution. Systems of tenancy. The cost of labor and equipment.

713 Farm Machines

Laboratory demonstration 2 hours a week.

This course includes demonstrations in the knocking down and setting up of agricultural implements used on the farm. It covers work with all the machinery used in connection with the planting, cultivation, and harvesting of farm crops.

Course II Fruit Growing and Market Gardening

Summary: recitation and lectures 18 hours, laboratory 20 hours a week.

714 Soil Fertility

Lecture 1 hour a week.

The relation of different soils and soil types to crop production, and their modification by cropping and fertilization. Sources of nitrogen, phosphoric acid, and potash, with comparisons of their costs and relative efficiency in diversified crop production with special adaptation to orcharding. Systems of crop rotation and the maintenance of fertility through the use of cover crops and green manures.

715 Principles of Plant Growth and Propagation of Plants

Lectures 2 hours, laboratory 2 hours a week during the first half of the session.

The propagation of plants is a line of horticultural effort that concerns both the fruit grower and market gardener. Thousands of vegetable plants, fruit trees, and ornamental shrubs are propagated annually, and it is the object of this course to acquaint the student with modern methods and practices used in this work. Certain principles of plant growth are directly involved in the propagation of plants. Such methods as propagation from seeds, cuttings, budding, and grafting are involved.

716 Principles of Pruning

Lectures 2 hours, laboratory 2 hours a week during the second half of the session.

Pruning is a necessary feature of orchard practice. It not only concerns the welfare of trees, shrubs, and vines, but becomes of economic importance in the spraying and harvesting of the fruit. The subject is treated fully. Nearby orchards furnish the students practice in pruning.

717 Spraying for the Control of Orchard Enemies

Lecture 1 hour, laboratory 2 hours a week during the second half of the session.

The spraying of fruit trees and plants has become a special as well as a necessary practice. The horticulturist should be familiar with all

local insects and fungus enemies and know the best methods of checking and controlling them. The student is given practical work in the compounding and preparation of spraying mixtures and instructed definitely as to the proper time to make thorough application. He is given definite methods of procedure in the control of plant enemies and in the purchase, care, and handling of spraying implements and machinery.

718 *Practical Fruit Growing*

Lectures 4 hours a week.

This course consists of a series of lectures giving the student definite principles and facts concerning fruit growing in New Jersey. Special attention is directed to the selection of soils and varieties. Methods of planting trees and in the harvesting and marketing of fruit. Small fruits, such as grapes, raspberries, blackberries, blueberries, currants, gooseberries, and strawberries are dealt with in the same practical manner.

719 *Systematic Pomology and Fruit Judging*

Lecture 1 hour, laboratory 2 hours a week during the first half of the session.

The variety factor has become a most important matter in successful fruit and vegetable production. Standard varieties of fruits and vegetables are placed before the student for the study of all characters that may assist in the identification of such varieties. Practice in fruit judging is also combined with this part of the course. Methods of packing, storing, and marketing are again emphasized.

720 *Plant Diseases*

Lecture 1 hour a week.

A lecture course, illustrated with lantern slides and specimens, on the common diseases and treatments of potatoes, tomatoes, truck and garden crops, apple, pear, quince, peach, plum, and cherry orchards, grain and forage crops, shade and ornamental trees. These lectures are supplemented by assigned readings.

721 *Vegetable Gardening*

Lectures 5 hours, laboratory 4 hours a week.

Definite principles and methods of growing and handling market garden and truck crops in New Jersey. The laboratory work is

designed to give the student practice in greenhouse construction, seed sowing (by hand and with seed drill), transplanting, construction and management of hotbeds and cold frames, variety studies, preparation for market, and vegetable forcing.

722 *Animal Husbandry*

Lecture 1 hour a week.

Principles of feeding, breeding, and management of work horses and other live stock appropriately found on an up-to-date fruit farm.

723 *Economic Entomology*

Lectures 2 hours, laboratory 4 hours a week.

A practical study of the recognition marks, life habits, injuries and benefits, and methods of controlling the work of insects injurious and beneficial to the common and important fruits.

724 *Poultry Husbandry*

Lecture 1 hour a week.

Same as 708 in course I.

725 *Woodshop and Forge Work*

Laboratory 4 hours a week.

Special work in the building of flats and cold frames is offered together with practical work in the wood and forge shop. Supplemented in part by a series of lectures.

726 *General Laboratory*

Laboratory equivalent 4 hours a week.

Visitation trips to orchards, gardens, and markets. One afternoon each week is given over to visitation of orchards or of farms where market gardening is practiced for the purpose of noting methods of management and marketing. One or two trips to special market centers are arranged for the sake of studying methods and practices of the commission merchants and produce distributors.

Course III Poultry Husbandry

Summary: recitation and lectures 18 hours, laboratory 20 hours a week.

727 *Types and Breeds of Poultry*

Lecture 1 hour a week.

Origin and history of the domestic fowl; standard and utility classification of poultry; origin, history, and general characteristics of all common breeds; development of modern varieties and strains; the present utility value of the different breeds.

728 *Poultry Breeding*

Lecture 1 hour a week.

The aim, problems, and basis for poultry breeding; definitions of literature; hereditary, Mendelism, and sex limitation; variations; miscellaneous laws and breeding phenomena; methods of mating and breeding; breeding for vigor, for egg production, for meat, and for color.

729 *Exhibition Scoring, and Judging*

Lectures 2 hours, laboratory 4 hours a week during the first half of the session.

History and development of the poultry show; types of score cards and general disqualifications; poultry dictionary and definition of terms; methods of running a poultry show; selecting judges, training birds for the show; scoring dressed poultry and market eggs.

730 *Preparation and Marketing of Poultry Products*

Lectures 2 hours, laboratory 4 hours a week during the second half of the session.

The salesman and the market; caponizing; killing, picking, and dressing; candling eggs; preservation of eggs; grading, packing, and shipping poultry products.

731 *Location, Design, and Construction of Buildings*

Lecture 1 hour, laboratory 4 hours a week.

Choosing the poultry farm; planning and laying out the farm; ventilation, moisture, and sunlight in the poultry house; miscellaneous

principles in house design; types of houses; foundation for the house; frame, floor, walls, and roofing; interior fixtures for the poultry house; figuring the cost of house; yards and yarding.

732 *Sanitation, Parasites, and Diseases*

Lectures 2 hours a week.

Sanitary measures for the poultryman; the classification and division of poultry diseases; the anatomy and physiology of the domestic fowl; the common diseases of poultry, with descriptions of preventive and curative measures; the external and internal parasites; poultry enemies.

733 *Incubation and Brooding*

Lecture 1 hour, laboratory 2 hours a week.

Natural incubation and brooding; types of artificial incubators; the construction of incubators; collection, selection, and saving eggs for incubation; the care of an incubator; development of the chick; artificial brooding; care of the brooder.

734 *Poultry Farm Management*

Lecture 1 hour, laboratory 2 hours a week.

Types and combinations of poultry farms; egg, broiler, and roaster farms; relations between capital and labor; farm rotation, appearances; poultry inventory; probable expenses and returns; records, accounts, and advertising.

735 *Principles and Practice of Poultry Feeding*

Lectures 2 hours a week.

Composition of the bird and her food; classification of poultry foods; physiology of digestion, objects of poultry feeding; feeding for growth, flesh production, and egg production; poultry farm crops and rotations.

736 *Turkeys, Geese, Ducks, and Pigeons*

Lecture 1 hour a week.

Origin and history of the breeds of ducks; breeding, housing, feeding, and marketing ducks; breeds of geese, general care and management of geese; turkey raising in the United States; pigeons, care and management; pheasant raising; ornamental birds.

737 Flock Practice

Laboratory 4 hours a week.

The student is charged with the care and feeding of a pen of birds and assigned work in incubation and brooding.

738 Animal Husbandry

Same as 722 in course II.

739 Practical Fruit Growing

Same as 709 in course I.

740 Soil Fertility

Same as 714 in course II.

741 Woodshop and Forge Work

Same as 725 in course II.

742 Agronomy

Lectures 2 hours a week.

A study of grains and forage crops particularly adapted for use on poultry farms, including the selection of crops and various methods of planting, cultivating, harvesting, and marketing them. A special study of the production of root and tuber crops useful in feeding the flock.

743 Vegetable Gardening

Lecture 1 hour a week.

A course designed to give definite particulars in growing and handling vegetable and garden crops generally found in the home garden.

744 Trips

Laboratory 2 hours a week.

Inspection trips, seminars, and sanitation. Includes visits to flocks, poultry shows, and poultry farms. The seminars aim to acquaint the student with poultry literature. Papers, debates, and discussions are required. The sanitation assignments include spraying and disinfection of poultry houses.

Course IV Home Economics

Summary: recitation and lectures 18 hours, laboratory 20 hours a week.

745 *Chemistry of Foods*

Lectures and demonstrations 2 hours a week.

This course is outlined for the purpose of familiarizing the student with the fundamentals of chemistry as related to food products intended for table use. Food values are compared, their composition determined, and classification made on the basis of energy units supplied by the several protein, carbohydrate, and fat carriers. Common practices of adulteration are exposed, while economy in the selection of food nutrients is given careful consideration. The chemical changes incident to canning, preserving, and pickling are explained and approved methods of procedure are outlined. A study of the yeast plant, together with that of other microorganisms, is included.

746 *Cooking Exercises*

Laboratory 6 hours a week.

A complete kitchen, equipped with coal and gas ranges, electric hot plates, and fireless cooker, makes it possible to offer a course in cooking that is very interesting and practical. Each student is assigned work in the laboratory kitchen where food products are assembled and prepared for cooking and table service. The following are among the exercises as planned: soups, their preparation and service; meats and vegetables, methods of cutting, preparing, cooking, and serving. Bread, pastry, and dessert making; salads, including the use of fruits, nuts, and dressings. Meat substitutes, the use of leftovers and methods of utilizing the cheaper cuts of meats, all of which is helpful in reducing the high cost of living. A lunch room is conducted in connection with the department where the prepared materials are served to students desiring such service.

747 *Home Nursing*

Lectures 2 hours, laboratory 2 hours a week during the first half of the session.

This course is provided to train the student in caring for the sick in the home, in order that they may be made comfortable when pro-

professional services are not available. A knowledge of what to do and when to do it is essential to meet emergencies which are apt to occur in every household. The course includes among other subjects the following: care of the sick-room and bed; care of the patient; turning, bathing, dressing, and moving; precautions necessary with contagious diseases; preparation and service of diet for children and convalescents; the making of gruels, broths, and other dainties; fumigation of the sick-room and premises; ventilation and proper care of sick-room; devices and methods for tactfully managing the patient during the various stages of his confinement.

748 *Emergencies*

Lectures 2 hours a week.

Outline of procedure in case of accidents, such as choking, drowning, flesh wounds, burns, etc. Methods of bandaging and cleansing wounds; creating artificial respiration; poisons and their antidotes; temporary means of relief in case of fractures, sprains, or contusions.

749 *Home Sanitation*

Lectures 2 hours a week.

The use of modern equipment in the home pertaining to ventilation, heating, lighting, and plumbing; the value of antiseptics, deodorizers, and various disinfecting preparations. Garbage disposal and sources of contamination of water, milk, and meats. Health in the home and how to preserve this essential to happiness.

750 *Home Management*

Lectures 3 hours a week.

The importance of a system in the management of home problems and duties. Marketing and shopping; furnishings for the home; artistic schemes for painting and interior decoration. Planning of houses for conveniences and home comforts. Choosing of carpets, rugs, curtains, etc. Methods of keeping accounts and purchasing supplies. A study of costs as related to the necessary upkeep of the various departments of the home or as concerns individual members of the family. The discovery of leaks due to a lack of systematic procedure in performing daily work in or about the home. House plans are drafted and specifications for equipment and furnishings are tabulated.

751 Sewing

The work in sewing consists of practical exercises in selection of materials, cutting, fitting, and assembling of patterns and wardrobes. Sewing machines, drafting tables, and forms for cutting and fitting of gowns are available for student use. The members of the class make up underclothing, shirtwaists, skirts, petticoats, children's furnishings and other necessary wearing apparel. The students become skilled in machine as well as hand sewing and are qualified to make selections of designs from fashion magazines with intelligence.

752 Millinery

A study of the harmony of color designs; the importance of exercising taste and skill in the selection of bonnets, hats, plumes, and other trimming materials. The re-blocking and use of frames and other materials on hand. Neatness, not extravagance, in modes of dress.

753 Principles of Laundry Practice

Use and comparative value of machinery devised for washing and drying clothes. Sorting and handling of flannels, silks, prints, laces, etc. Practice in renovating and removing spots and stains. Action of washing powders, soaps, and chemicals; electric devices for washing, ironing, and pressing. Uses of starch, bluing, soda, ammonia, etc. Practice in ironing, pressing, and dyeing.

754 Personal Hygiene

The proper care of the body as related to cleanliness, health, and vitality. Exercises bringing into use muscles controlling or affecting respiration, circulation, and general activity of functioning organs of the body. Common causes of lack of vigor leading to illness or diseases. Rest or activity as a factor influencing digestion and assimilation of food. Maintenance requirements of the body based upon the kind of work or activity encountered. Dietetics as related to health and disease.

755 General Lectures

Two hours a week.

A special course has been arranged for this division, consisting of lectures and demonstration work in entomology, floriculture, bacteriology, food values of poultry products, home butter making, and handling of milk.

Course V Bee Husbandry

Summary: recitation and lectures 18 hours, laboratory 20 hours a week.

756 *Soils and Fertilizers*

Same as 701 in course I.

757 *Animal Production and Feeding*

Same as 702 in course I.

758 *Agronomy*

Same as 704 in course I.

759 *Practical Fruit Growing*

Same as 709 in course I.

760 *Farm Management*

Same as 712 in course I.

761 *Economic Entomology*

Same as 723 in course II.

762 *Shop Practice*

Same as 725 in course II.

763 *Honey Plants*

Lecture 1 hour a week.

Recognition marks, distribution, and importance of the principal nectar secreting plants.

764 *Honeys*

Lecture 1 hour, laboratory 2 hours a week.

Recognition marks and uses of the principal kinds of honey.

765 *Bee Husbandry*

Lectures 6 hours, laboratory 8 hours a week.

A practical study of the anatomy and physiology of the individual bee and of the colony and a careful consideration of the general principles which underlie the practice of successful bee-keeping. Natural enemies and diseases of bees; wintering; preparation for the honey flow; management during the honey flow; control and prevention of swarming; queen rearing; hives, fixtures, and tools.

LABORATORY EQUIPMENT AND PRACTICES

The practical work scheduled as laboratory practices is planned for all the courses in such a way that the student is enabled to make the best use of his time. The demonstrations are supplemented by the use of lantern slides and models, while the equipment assembled in the various departments of the Experiment Station is available for student use. The dairy laboratory is equipped with modern machinery essential for the care and handling of milk and butter. For the live stock judging work there are available specimens of horses, dairy cattle, sheep, and swine, and the students are given actual work in the scoring of animals and the placing of classes. The shop and forge work consists of practical work in bench and forge practices, while different types and makes of machines are assembled for class use. The equipment available for the fruit growing and market gardening practice work includes greenhouses especially designed for class work, where practical exercises are given in plant propagation and greenhouse management. The station orchards furnish excellent specimens for judging work, while the nursery and the orchard are used extensively for spraying and pruning exercises. The crop laboratory is provided with many different varieties of grains adapted to New Jersey, so that the student can study and familiarize himself with these cereals. Material is also provided for the judging and grading of grain, so that the student can select his seed with the best of care. The laboratory is further furnished with grasses and legumes representing those best adapted for forage crops in the State. Flock practice and the care of incubators and brooders constitute work required daily in the poultry department. Each student is given a flock of birds and is charged with the care of an incubator and the rearing of the chicks until they are six weeks of age. The facilities for practical work in home economics and domestic art are unique; the entire top floor in

the short course building is devoted to this department. Eighteen lecture hours and twenty laboratory hours are required in each course.

The aim of the Short Courses in Agriculture is to train young men and young women in the science of agriculture and in the art of home making. That the courses are useful and practical is evidenced by the increased enrolment from year to year and by the subsequent achievements of young men and women completing the courses.

DIPLOMAS AND CERTIFICATES

THE BACHELOR'S DEGREE

THE DEGREE of Bachelor of Arts (A.B.), Bachelor of Letters (Litt.B.), or Bachelor of Science (B.Sc.) is conferred by the Trustees upon students in full standing who satisfactorily complete the corresponding four-year course as described on pages 56 to 87, and the appropriate diploma is granted. Students in the general science course, however, who take more than half their elective work in language, history, political science, ethics, pedagogy, and philosophy will receive the degree of Bachelor of Letters.

In the case of Bachelor of Science graduates who have pursued the technical science courses, the words "in Agriculture," "in Biology," "in Ceramics," "in Chemistry," "in Civil Engineering," "in Electrical Engineering," "in Mechanical Engineering," are officially recorded to correspond with the course taken.

The degree of Bachelor of Divinity (B.D.) is conferred by the Trustees on students graduating from the Theological Seminary in New Brunswick who present certificates from the Faculty of the Seminary showing that they have done the special work and successfully passed the special examinations prescribed for the degree.

HIGHER DEGREES

Applications to pursue courses leading to higher degrees should be filed in the office of the Registrar not later than October 1. Blank forms for this purpose will be furnished

by the Registrar. Each application should be accompanied by testimonials of fitness to pursue the courses proposed in the application.

The Master's Degree

To students graduated since 1912 the master's degree will be granted on the following conditions:

1 This degree is to be given after extended liberal study and not, as in the case of the doctor's degree, after intense application to one subject and to original research.

2 The studies pursued by the candidate for this degree shall constitute a course by themselves, as they would if he were studying law or divinity.

3 The course must consist of three subjects to be pursued by the student for two years, ordinarily in residence at Rutgers; equivalent graduate courses pursued at another institution may, however, be substituted for the first year's requirements.

4 The character of such studies shall not differ essentially from that of the elective courses now widely offered to seniors in our colleges; in other words their character shall be elementary and liberal.

Earlier graduates who so desire may apply for the degree on the basis of the former requirements, which may be found in earlier editions of the catalog or will be furnished upon application to the Registrar.

The Faculty will also recommend for the master's degree regularly enrolled graduate students who shall, in residence, have satisfactorily completed the work of one year in the research and investigation required for the degree of Doctor of Philosophy.

Candidates are required to submit their theses at least one month before the granting of the degree.

The nature of the degree to be conferred, whether Master

of Arts or Master of Science, will be determined by the kind of studies pursued and work done in the graduate rather than in the undergraduate years.

The Doctor's Degree

The Trustees have not yet established a separate school for graduates, but several of the departments of the College are provided with facilities and with a teaching force adequate to the demands of a limited number of graduates who may desire to pursue courses of study and research leading to the degree of Doctor of Philosophy (Ph.D.).

For enrolment as a candidate for this degree it is required that the applicant present a diploma of graduation from Rutgers College or from a college whose diploma shall have been accepted by the Faculty of Rutgers as entitling the applicant to such enrolment. The candidate must further satisfy the professors in charge of his graduate work that he has a reading knowledge of French and German sufficient to enable him to carry on advanced or research work successfully. Enrolment is granted by a vote of the Faculty only when the application is accompanied by a statement from the head of the department in which the applicant proposes to do his principal work, certifying the readiness of the department to receive him as a candidate for the degree of doctor.

Students thus accepted as candidates will be recommended for the doctor's degree on the fulfilment of the following requirements:

- 1 While no determinate period will in any case be assigned for the attainment of the doctor's degree, all candidates are required to spend at least three years in the pursuit of an accepted course of study. This work is to be done in residence at Rutgers, but equivalent graduate

courses begun at other institutions may be substituted for all but the work of the final year.

2 A certificate, signed by the professors in charge of the candidate's graduate work, stating that the preliminary requirements in French and German have been fully met, must be filed at least one year previous to the final examination for the doctor's degree.

3 The accepted course shall include a principal subject and either one or two secondary subjects. The principal subject must be of such a character as to engage the creative and constructive powers of the candidate.

4 The secondary subject or subjects must be chosen in a department other than that of the principal subject, but the head of the department in which the candidate takes his principal subject will advise in regard to the choice of the secondary work, which must have such relation to the principal subject as shall more or less immediately contribute to the value of the principal work.

5 An examination which shall satisfy those having direction of the candidate's studies and the Faculty that the candidate is fitted to receive the doctor's degree.

6 A thesis upon some question connected with the principal subject, which shall be the result of the candidate's original investigation and an actual contribution to knowledge. This thesis must be submitted to the head of the department in which the principal subject has been pursued at least four months before the final examination.

Engineering Degrees

The degrees of Civil Engineer (C.E.), Electrical Engineer (E.E.), Mechanical Engineer (M.E.), and Ceramic Engineer (Cr.E.) are professional degrees and are on application conferred upon candidates who after graduation from

an appropriate course in this College have passed three years in the practice and study of their profession, provided each such candidate shall present to the Faculty, together with a statement of the work upon which he has been engaged during this period, a satisfactory thesis or discussion of some engineering work which he has done.

CERTIFICATES

To students who have satisfactorily pursued the short course in Clay-working, a short course in Agriculture, or other special courses of study, a certificate is granted stating the studies pursued and the attainments made.

Certificates are also given for courses completed in the summer session, and these are accepted by the State Board of Examiners in all subjects required for any kind of State teacher's certificate.

HONORS

GRADUATION HONORS

General Honors

GENERAL HONORS are awarded at graduation on the basis of scholarship, three classes of honor students being recognized:

- 1 Highest honors are awarded to students who have attained an average grade of "A" (see page 243), and no single grade lower than "B."
- 2 High honors are awarded to students who have received an average of "B" or above and no single grade lower than "C."
- 3 Honors are awarded to students who have received an average of "B" or above for the entire course.

Special Honors

Special honors at graduation may be awarded in any elective pursued during the junior and senior years to students in the Bachelor of Arts, the Bachelor of Letters, or the general Bachelor of Science course. To be eligible to receive such an honor a student must satisfy the following conditions:

- 1 He must rank highest of those pursuing the same elective.
- 2 He must have maintained an average grade of "B" (see page 243) in the elective subject during the junior and senior years, and also in all the other studies of his course.
- 3 He must be recommended to receive the honor by the professor or professors who have instructed him in the elective.

Special honors at graduation may also be awarded to students pursuing the technical Bachelor of Science courses. To

be eligible to receive such a technical science honor a student must satisfy the following conditions:

1 He must have maintained an average grade of "B" (see page 243) in the technical elective subjects of the junior and senior years, and also in all the studies of the course.

2 He must be recommended to receive the honor by the professor or professors who have instructed him in the technical science subjects of his course.

Commencement Speakers

Members of the graduating class, not exceeding three in number, are appointed to speak at commencement. These are chosen by grade in speaking and composition during the entire course from the students who have been awarded general scholarship honors.

Phi Beta Kappa

Those students that have won general scholarship honors may be recommended for election to the Phi Beta Kappa Society to the number of one-seventh of the graduating class. In case the honor men exceed this number those of highest rank are selected.

Military Distinction

The orders of the War Department provide that on the graduation of every class the names of such students as have shown special aptitude for military service shall be reported to the Adjutant General of the United States Army and to the Adjutant Generals of their respective states.

One of these is designated by the Professor of Military Science as the "Best Soldier" and his name is engraved on a bronze tablet provided for that purpose in the Ballantine Gymnasium.

JUNIOR ORATORICAL HONORS

Eight members of the junior class in the regular courses are chosen each year on account of their ability in composition and in public speaking to deliver original speeches on the evening preceding commencement. The selection is made by a committee of three persons appointed for that purpose by the Faculty. To the best writers and speakers among the junior orators are awarded the Irving S. Upson Prizes in Oratory (see page 207).

SOPHOMORE ORATORICAL HONORS

Members of the sophomore class in full standing who have pursued a regular course from the beginning of the freshman year and who are recommended by the Professor of the Art of Public Speaking may contest for oratorical honors. Eight are chosen in the order of merit, of whom the first two receive the Myron W. Smith Memorial Prizes in Oratory (see page 207).

CLASS HONORS AND HONOR STUDENTS

The list of honor men of the two lower classes is published in the Register of the *College Catalog* and the *Scientific School Report*. Beginning in 1917-1918 the honor men of the junior class will be included in this roll.

Class honors are determined as follows:—

- 1 Freshman honors are awarded to those members of the freshman class who maintain an average grade for the year of B or above.
- 2 Sophomore honors are awarded to those members of the sophomore class who maintain an average grade for the year of B or above, provided that not more than three term-hours in their schedules are graded below C.

3 Junior honors are awarded to those members of the junior class who maintain an average grade for the year of B or above, provided that no one of their courses is graded lower than C.

4 Students who make both freshman and sophomore honors constitute the "honor group" in the junior year. In case any member of this group fails to win junior honors, he forfeits for his senior year the privileges of the honor student.

5 A student who has failed to win freshman honors, but who wins both sophomore and junior honors, is placed in the honor group and granted the privileges of the honor men for his senior year.

HONORABLE MENTION

For the encouragement of additional or independent reading or study and original investigation under the direction of the Faculty honorable mention is made of students who give evidence of thoroughness in such work and pass a satisfactory examination. This work is done outside the course and without reference to a prize.

FELLOWSHIPS

APPLICATIONS for the first three fellowships should be filed with the Registrar not later than the first of May. The written consent of parent or guardian is necessary in case the applicant is under 21 years of age. Applications from graduates should give an account of work done since graduation and should be accompanied by appropriate testimonials. No testimonials or endorsements are required for students still in college.

Assignment of the various agricultural research fellowships is made on the recommendation of the Dean of Agriculture.

Every student holding a fellowship is expected to give some assistance in undergraduate instruction or laboratory practice.

BLODGETT FELLOWSHIP IN SCIENCE

James H. Blodgett, of Washington, D. C., has given a fund for the encouragement of advanced study in the Scientific School. Whenever the accumulated income from this investment amounts to \$200 that sum is paid in quarterly instalments to a graduate of Rutgers holding the degree of Bachelor of Science, who is selected by a committee appointed by the Faculty and who is designated as Blodgett Fellow in Science. Besides pursuing graduate studies in the Scientific School for one year the holder of this fellowship is required to render assistance to the professor having the direction of such studies and for that service is exempt from the payment of all fees.

VANDER POEL FELLOWSHIP IN CHEMISTRY

This fellowship was established by a bequest of the late John A. Vander Poel of the class of 1889. The income is awarded annually by the Faculty to graduate or undergraduate students of the College. "So far as may be convenient the student to receive such scholarship income shall be one pursuing a course of study in chemistry or other science."

**HERBERT MEMORIAL FELLOWSHIP IN
POLITICAL SCIENCE**

The John Oliver Herbert Memorial Fellowship Fund was established by John W. Herbert, a graduate of the class of 1872 and a trustee of the College. This income is awarded by the Faculty annually at the close of the college year to a member of the senior class "as a result of competitive examination coupled with regard to excellence of general qualifications and with respect to the college standing of competitors." It is to be clearly understood that the competitive examination is not the only controlling factor but that general scholarship also and position occupied in college life and work during the undergraduate course shall be considered. The incumbent holds the appointment for one year of graduate study at the College, pursuing for his major work studies in political science. At the close of the year he is required to present a thesis based on original investigation and bearing upon the "influence of Christian ideals upon policies of governments and the effects of such policies on nations." This thesis is published under the auspices of the College from the income of the fund.

If there is no satisfactory candidate in the senior class of any year the Faculty may award the fellowship for a second year to the preceding incumbent or may select an earlier graduate.

AGRICULTURAL RESEARCH FELLOWSHIPS

Pulverized Limestone Research Fellowship.—This fellowship was established by Mr. Thomas A. Edison, of Orange, New Jersey. Under this grant, which is for a period of three years and which provides for an income of \$600 per annum, the fellow is to conduct investigations on the chemical and biological changes produced in the soil by applications of pulverized limestone. He is also to make a study of bacteria, molds, and protozoa of the soil as affected by applications of pulverized limestone, as well as the transformation of mineral substances in the soil and the formation of available plant food.

Ammonium Sulphate Research Fellowship.—The value of ammonium sulphate as a source of nitrogen to vegetation is to be studied under a grant made by the American Coal Products Company, of New York City. The grant is for a period of three years and provides an income of \$600 per annum. The appointee to this fellowship is to conduct investigations on the availability of nitrogenous plant foods with special reference to the availability of nitrogen in ammonium sulphate. A study is also to be made of the function of the sulphur in ammonium sulphate. Field and pot experiments are to be conducted in order to determine the changes which this substance undergoes in the soil and the chemical and biological changes produced by its application.

Potash Research Fellowship.—The sum of \$3,000 has been appropriated by the German Kali Works for the establishment of a research fellowship at Rutgers College. One thousand dollars per annum for a period of three years is to be utilized for the study of important potash salts in their relation to the activities of microorganisms in cultivated land. Investigations are also to be conducted by the fellow on the fixation of potash in soils of different origin and com-

position and on the distribution and transformation of potash compounds in the soil. Laboratory, greenhouse, and field experiments are to be conducted as a means of inquiry into this important phase of soil fertility.

Suarez-Mujica Nitrate Research Fellowship.—The increasing interest in the subject of the availability of nitrogen has led the Nitrate Propaganda to appropriate the sum of \$2,000 for the establishment of a research fellowship at Rutgers College. This sum, distributed over a period of three years, is to be utilized for investigations of the factors which influence the transformation and utilization of nitrate nitrogen in the soil. Chemical and bacteriological methods are to be employed by the fellow in the study of the important reactions that occur in land which has received applications of sodium nitrate. Also study is to be made of the factors that are responsible for the differences in the recovery of nitrate nitrogen by different crops and under varying seasonal and soil conditions.

Amo-Phos Research Fellowship.—A grant of \$1,800 has been made by the American Cyanamid Company, of Buffalo, New York, for the establishment of a research fellowship. The holder of this fellowship is to receive an income of \$600 per annum for a period of three years. He is to conduct investigations on the utilization of the fertilizer known as Amo-Phos under different soil and seasonal conditions. A thorough study is to be made of the transformation of this substance as affected by chemical and bacteriological reactions in the soil. The soil solutions as modified by applications of Amo-Phos are to be studied and their relation to the growing of cultivated crops carefully noted.

Soy Bean Research Fellowship.—The growing importance of the soy bean as a forage and seed crop has encouraged its cultivation in the United States. A large number of varieties have been introduced from China and Japan, many of which

show marked differences in length of growing season and in composition. These differences include striking variations in the proportion and quality of the crude fat present in the seed, and it has been observed that soy bean oil offers possibilities as a semi-drying oil for industrial purposes. In order to provide for the study of the industrial value of soy beans, the Murphy Varnish Company, of Newark, New Jersey, has appropriated the sum of \$1,800 for the establishment of a research fellowship at Rutgers College. The fellow appointed under this grant is to have an income of \$600 per annum for a period of three years.

Zinc Oxide Research Fellowship.—This was established for a period of three years by the New Jersey Zinc Company, and provides for the study of fungi responsible for the deterioration of paints on the interior walls of greenhouses and other buildings.

SCHOLARSHIPS AND BENEFICIARY AID

GENERAL SCHOLARSHIPS

CERTAIN scholarships established by college endowment funds may be assigned to young men of approved character and ability whose financial circumstances are such as to make assistance necessary.

STATE SCHOLARSHIPS

Scholarships available to residents of New Jersey fall into two classes: (1) those established by the State law of 1864, and (2) those provided by the law of 1890, as amended in 1905. These are described in the following paragraphs and further information may be obtained upon application to the President or the Registrar.

Act of 1864

Under this law a certain number of students from the State of New Jersey are received into the Scientific School and educated free of expense for tuition. These students are admitted to such scholarships on the recommendation of the superintendent of schools in each county after passing the required examinations (see page 47). The whole number of scholarships provided by the Act of 1864 is 40, distributed among the counties in proportion to their population.

Act of 1890

By a law passed March 31, 1890, and amended by an act of March 31, 1905, a number of scholarships for each

year, equal to the number of Assemblymen, are offered to students in all parts of the State.

The candidates for these scholarships are selected by a competitive examination held under the direction of the city and county superintendents of education in each county of the State on the first Friday in June and the Saturday following of each year. The whole number of such scholarships to be awarded each year is 60, and any candidate who passes the examination is entitled to an appointment, provided there is a vacancy in any district.

These scholarships cover all the college fees, including the charges for tuition, public room service, and special fees.

BENEFICIARY FUNDS

The Trustees of the College hold in trust certain funds, the income of which is available for the assistance of students who are preparing for the ministry of the Reformed Church in America. Every student thus aided receives \$180 annually and must engage to pursue his studies uninterruptedly until he shall have completed the course in one of the theological schools under the care of the General Synod of this Church. The beneficiary trusts thus held by the College are: the Brownlee Memorial Fund, \$3,000; the Hedges Scholarship Fund, \$6,000; the Hopper Fund, \$3,000; the Knox Fund, \$3,000; the Mandeville Fund, \$7,000; the Smock Fund, \$1,000; the Van Bunschooten Fund, \$20,000; the Van Lieu Fund, \$1,000; the Voorhees Fund, \$36,000; the Vreeland Legacy Fund, \$2,000.

The Board of Education of the Reformed Church also grants aid to young men preparing for the ministry in the denomination. Information may be had by addressing the Secretary of the Board of Education, 25 East Twenty-second Street, New York, N. Y.

THE RHODES SCHOLARSHIPS

Under the Foundation established by the will of the late Rt. Hon. Cecil John Rhodes, of South Africa, two scholarships at the University of Oxford are constantly available for students representing the State of New Jersey. Candidates must have finished two years of work at an American college, and must either reside in the State of New Jersey or have received there the major part of their education. A qualifying examination, representing the entrance examination of the University of Oxford, is held at Trenton two years out of every three, and from those who have passed this examination one is selected for the scholarship each year that the examination is held. The award is made by the New Jersey Committee of Selection, and has regard to literary, athletic, social, and moral attainments, as well as to those of scholarship. The next examination will be held in October, 1917, and the successful candidate will go into residence at Oxford one year from that date. The scholarships have an annual value of £300, and are tenable for three years. Particulars may be obtained from the Registrar of Rutgers College, or from the office of the Rhodes Trust, Seymour House, Waterloo Place, London, S. W., England. Similar scholarships are available for other states in the American Union.

Rhodes scholars from Rutgers, with their terms of residence at Oxford:

FRANCIS MARMADUKE POTTER '09

1908-1911, B.A. (Oxford, 1911)

SAMUEL ARTHUR DEVAN '09

1910-1913, B.A. (Oxford, 1913)

VALENTINE BRITTON HAVENS '12

1913-1916, B.A. in Jurisprudence (Oxford, 1916)

ROY MUNDY DAVIDSON RICHARDSON '15

1916-1919.

PRIZES

IN EVERY CASE where it is expected that a prize will be awarded for work done it is distinctly announced that unless in the opinion of the examiners the work submitted is of such excellence as to merit a prize none will be awarded.

Whenever a prize requires both an essay and an examination the essay must be handed in before the hours fixed for the examination.

All prizes are open equally to students in all courses leading to a degree except in cases where they are specially limited by the donor. Each competitor for a prize must sign a written declaration that the essay or other work offered by him is his original and unaided work. The essays are to be written on paper of a prescribed kind and the successful essay is to be deposited in the College Library before the writer is entitled to the prize.

The announcement of prize subjects, published in July for each college year, may be obtained from the Registrar.

SENIOR PRIZES

James Suydam Prize in English Composition.—A gold medal of the value of \$25, or that sum in money, the gift of James Suydam, is awarded annually to that member of the senior class who attains the highest standing in composition, the basis of award being an average made up of the combined grades of the essays of the four years course, and of a special essay on an assigned subject.

James Suydam Prize in Natural Science.—A gold medal of the value of \$25, or that sum in money, the gift of James Suydam, is awarded annually to that senior in the Technical Science course (or in the General Science course if one-half or more of his hours during the four years be devoted to science and mathematics) who has attained honor rank. The award is made for the highest average grade in all scientific subjects, required or elective, pursued by him during his four years course.

Jacob Brodhead Classical Prize.—This prize was founded by the Reverend Jacob Brodhead, D.D., and his son J. Romeyn Brodhead, LL.D., by the gift of \$700. The income (\$35) is awarded annually to that senior

or junior pursuing the Classical course who passes the best examination in an assigned Latin or Greek text and who also submits the best essay, written in English, on an assigned Latin or Greek subject; the text assigned to be in Latin and Greek in alternate years.

Joseph P. Bradley Prize in Mathematics.—Founded by the Honorable Joseph P. Bradley, LL.D., of the class of 1836, this prize is maintained by his son, Charles Bradley, A.M., of the class of 1876. It consists of a valuable mathematical work which is awarded annually to that student of the senior class who presents the best solutions of a set of mathematical problems proposed to the class during the second term by the Professor of Mathematics.

Elizabeth Appleton Memorial Prize in Moral Science.—By a gift of \$500 from the Reverend Samuel E. Appleton, D.D., of the class of 1852, this prize was founded in the name of his mother, Mrs. Elizabeth Appleton. The income from this fund (\$25) is awarded to that member of the senior class who passes the best examination in moral science.

Ann Van Nest Bussing Prizes in Extempore Speaking.—Mrs. Ann Van Nest Bussing has given \$1,000 the income of which (\$50) is to be expended each year for books to be selected by the President of the College and given as follows: the first prize (\$30) to that member of the senior class who proves himself to be the best extemporaneous speaker; the second prize (\$20) to the second best extemporaneous speaker of the senior class.

Monsignor O'Grady Prizes in Extempore Speaking.—A first prize of \$15 and a second prize of \$10, the gift of the Right Reverend Monsignor O'Grady, are awarded to the best and second best extemporaneous speakers of the senior class at the annual public competition in this exercise.

Class of 1876 Prize in Political Science.—The class of 1876 has given \$1,000 as the foundation of a prize fund for the encouragement of the study of political science. The income of this fund is awarded each year to a member of the senior class (either classical or scientific) "on the basis of an original essay on some subject in political philosophy, assigned by the professor of that science in the College, and upon a competitive examination in a textbook also selected by him;" the committee of award to consist of "three competent persons selected by the Faculty of the College, at least one member of the committee to be a member of the class of 1876 as long as any may be living."

Jacob Cooper Prize in Logic.—An annual prize of \$50 has been established in memory of the late Professor Jacob Cooper, LL.D., formerly Professor of Logic and Mental Philosophy in the College. This is the income of a gift of \$1,000 by Leonor F. Loree, M.Sc., C.E., of the class of 1877 and a trustee of the College, and the Honorable William W. Crapo, a classmate of Doctor Cooper in the Class of 1852 at Yale College. This prize is open to all students in full standing in the senior class.

Theodore Frelinghuysen Vail Prize for Scholarship.—An annual prize of \$50, the gift of Theodore Frelinghuysen Vail, A.M., of the class of 1851, is awarded to that member of the graduating class who stands highest in average grade of scholarship in all the subjects pursued throughout his senior year, provided he has received an average of B or above and no single grade lower than C.

Thomas Henry Grant Prize in Agriculture.—A prize of \$25, the gift of Thomas Henry Grant, M.Sc., of the class of 1881, is awarded annually to that member of the graduating class who stands highest in average

grade of scholarship in all the technical elective subjects of the senior year in the four-year Course in Agriculture, provided he also ranks high in each prescribed subject during the same year.

John Bernhard Smith Memorial Prize in Electrical Engineering.—An annual prize of \$25, the gift of Mrs. John Bernhard Smith, is awarded to that member of the senior class in the electrical engineering department who passes the best competitive examination in some electrical engineering subject to be assigned by the department.

SENIOR AND JUNIOR PRIZES

John Parker Winner Memorial Prize in Mental Science.—This prize consists of \$25, given by John Winner, Jr., A.M., of the class of 1866, and his wife, in memory of their son, John Parker Winner. It is open to competition for students in any course leading to a degree, who are pursuing the study of mental philosophy, and is awarded annually to the one who passes the best examination on some work and writes the best essay on some subject assigned by the Professor of Philosophy, the essay to consist of not less than 3,000 words.

William H. Van Doren Prize for Essay on Missions.—This prize of \$35, the gift of the Reverend William H. Van Doren, D.D., is open to competition for members of the senior and junior classes and for members of the Theological Seminary in New Brunswick. It is awarded annually for the best essay on Christian missions.

Joseph P. Bradley Prize in Roman Law.—An annual prize was founded by the Honorable Joseph P. Bradley, LL.D., of the class of 1836, late Associate Justice of the Supreme Court of the United States, and is maintained by his son, Charles Bradley, A.M., of the class of 1876. It consists of a valuable work on Roman law.

Luther Laffin Memorial Prizes in Mental Science.—These prizes are given by Luther Laffin Kellogg, LL.D., of the class of 1870 and a trustee of the College in memory of his grandfather, Luther Laffin. A first prize of \$75 and a second prize of \$50 are open to students of either the junior or the senior class in the Bachelor of Arts and Bachelor of Letters courses. They are awarded annually on the basis of an examination on some work and an essay on some theme, both to be assigned by the Professor of Philosophy.

Municipal Management Prize.—A resident of Highland Park offers a prize of \$50 open to competition by members of the junior and senior classes. This prize is awarded to the writer of the best essay, if judged to be of sufficient merit, on the subject: *A Study of the Organization of Minor Municipalities in New Jersey.*

The design of the donor is to encourage investigation into the structure and municipal activities, actual and possible, of the borough, town, township, and village in New Jersey. It is suggested that the work include a study at first hand of neighboring boroughs, one or more, such as Highland Park, Metuchen, Milltown or similar municipal corporations.

Prize in Sociology and Political Science.—Julius Heidingsfeld, Esq., offers a prize of \$50 to the members of the junior and senior classes of the current year for the best essay, if of sufficient merit, on the subject: *Elements distinctly Christian in the Social and Political Relations of To-day.*

JUNIOR PRIZES

Irving S. Upson Prizes in Oratory.—These prizes, of \$30 and \$20 respectively, were founded by Irving S. Upson, A.M., of the class of 1881, late Treasurer and Registrar of the College, by the gift of \$1,000. They are awarded annually by a special committee to those junior orators (see page 194) who are adjudged the best writers and speakers.

SOPHOMORE PRIZES

Myron W. Smith Memorial Prizes in Oratory.—These prizes were founded by Lyndon A. Smith, M.D., in the name of his son, Adjutant Myron W. Smith of the class of 1858, who gave his life in the Civil War to the cause of his country. They consist of the income (\$25) from \$500 proportionately appropriated to two medals, one of gold and the other of silver, which are to be awarded annually to the best and second best orators of the sophomore class. Only those students who have pursued the regular studies from the beginning of the freshman year are permitted to contend for these prizes. (See page 194)

Peter Spader Prizes in Modern History.—These prizes, founded by P. Vanderbilt Spader, A.B., of the class of 1849, in memory of his father, Peter Spader, are two in number (\$20 and \$15), the income from \$400 and \$300 respectively, and are awarded annually to those members of the sophomore class who present the best essays on some subject in modern history selected by the Professor of History with the approval of the Faculty. The subject is announced at the close of the freshman year and the competing essays are to be submitted on or before the last Monday in May of the sophomore year.

FRESHMAN PRIZES

Tunis Quick Prize in English Grammar and Spelling.—This prize of \$15, established by P. Vanderbilt Spader, A.B., of the class of 1849, in memory of his grandfather, Tunis Quick, is the income of a gift of \$300. It is awarded annually to that member of the freshman class in any course who passes the best written examination in spelling and English grammar under the direction of the Professor of English Literature at as early a day as convenient in the second college term.

Edward Livingston Barbour Prizes in Declamation.—Two annual prizes, of the value of \$15 and \$10, are offered by the Professor of the Art of Public Speaking. The eight members of the freshman class who stand highest in public speaking during the entire year may compete before a committee appointed by the Faculty.

GENERAL PRIZES

Samuel and Louisa Van Vechten Prize for Essay on Missions.—By the gift of \$1,000 in 1884 the late A. V. W. Van Vechten founded a prize of \$50 in honor of his mother, Mrs. Louisa Van Vechten, and his father, the Reverend Samuel Van Vechten, D.D., the prize "to be given annually to that student of Rutgers College who shall be adjudged by the Faculty of

the Theological Seminary of the Reformed Church of America, at New Brunswick, to have presented an article original with himself and the best submitted—the most conclusive and inspiring to strengthen faith in and love for Foreign Missions." The essays are limited to 3,000 words and are to be presented on or before May 1 of each year.

Mary E. Horton Prize in Music.—In recognition of the services to education rendered by Mary E. Horton, first Professor of Greek in Wellesley College, a fund of \$3,000 has been given to the College. From the income of this fund a prize is offered to that student who, by competitive trial or in such other manner as the President may determine, shall be designated as leader in the musical exercises in which the College as a body engages. Payment of the prize will be made in cash in equal instalments at the end of the first and second terms.

Chicago Alumni Club Prize in Literature and Library Use.—The Rutgers Club of Chicago offers a prize of \$35 for the best course of general reading pursued, together with proficient use of the library. The prize is open to all undergraduates. The basis of award is (1) an examination, testing the amount, quality, and thoroughness of the reading, and (2) a formal record, showing the field covered and the library method.

Alliance française Prize in French.—The Alliance française de New Brunswick makes annual award of a silver medal to that student of Rutgers College who, in a special competitive examination, gives evidence of the greatest proficiency in French. The contest is open to all undergraduates whether or not they pursue the study of French in course. The winner of the medal is not allowed to compete in subsequent years.

John P. Wall Targum Prize.—A first prize of \$10 and a second prize of \$5, the gift of John P. Wall, are awarded annually by the Targum Board for the best and second best contributions to *The Targum*, the weekly student paper.

SHORT COURSE PRIZES

Thomas Henry Grant Prizes in Agriculture.—Five prizes, the gift of Thomas Henry Grant, M.Sc., of the class of 1881, are awarded annually in the Short Courses in Agriculture, as follows: A prize of \$5 to the student who makes the highest attainments in any course; five prizes of \$4 each to the student in each of the five courses who takes highest rank, exclusive of the winner of the first prize.

GROUNDS AND BUILDINGS

GROUNDS

Queen's Campus

QUEEN'S CAMPUS, in large part a gift from the estate of James Parker, was acquired early in the nineteenth century, when Queen's College, the oldest of the present buildings, was erected. It is spacious and beautiful with lawn and elm trees and now has seven buildings erected upon it: Queen's College, the Alumni and Faculty House, Van Nest Hall, the Daniel S. Schanck Observatory, Geological Hall, the Sophia Astley Kirkpatrick Memorial Chapel, and Winants Hall.

Neilson Campus

The Neilson Campus, given in part during former years and in greatest part in 1906 by James Neilson, A.M., LL.B., of the class of 1866 and a trustee of the College, adjoins Queen's Campus to the north and has erected upon it New Jersey Hall, the Robert F. Ballantine Gymnasium, the Ralph Voorhees Library, the Engineering Building, the Chemistry Building, the Entomology Building, and the J. Howard Ford Dormitory.

Neilson Athletic Field

The Neilson Athletic Field, the use of which is donated to the Athletic Association also by Mr. Neilson, lies about ten minutes' walk from the main campus, and offers all possible advantages for football, baseball, track athletics, and military drill. It has a quarter-mile track, a grandstand seating 375, and bleachers with a capacity of 3,000.

College Farm

The College Farm of 350 acres, located about one and one-half miles south of the College, is the place of field work of the agricultural courses and of the College and State Agricultural Experiment Stations. Here also are the agricultural buildings equipped for laboratory work in horticulture, animal, dairy, and poultry husbandry, farm crops, and soil fertility. The most important varieties of corn, oats, and wheat as well as forage plants are grown in the variety tests. These afford ample opportunity for the study of crops both during the growing period and in the laboratory. Business methods are applied to the conduct of several of the departments of the Experiment Stations. The latter serve, therefore, as object lessons in modern profitable agricultural practice.

BUILDINGS ON THE CAMPUS

Queen's College (1808-1809)

Queen's occupies the central position of the group of college buildings. It contains the administrative offices, twelve recitation rooms, and the Fine Arts lecture hall. It was designed and built by John McComb, the architect of the New York City Hall, and architecturally is considered one of the best structures of its type.

Alumni and Faculty House (1841-1842)

This building, erected as the President's house, so used for many years, and more recently devoted to the department of fine arts, is now designated for the social uses of Alumni and Faculty. The Rutgers Club of New Brunswick with the assistance of class gifts has renovated the house, furnished it, and assumed its maintenance.

Van Nest Hall (1845)

This building was named for Abraham Van Nest, a liberal trustee, in recognition of his services and gifts to the College. In 1893 it was dignified by the addition of an appropriate stone porch, the gift of Mrs. Ann Van Nest Bussing, daughter of Abraham Van Nest, who at the same time refitted the east side of the second story into a handsome hall for the exercises in elocution. During the same year the Trustees added a third story to the original building.

The rooms on the first floor originally used by the Peithessophiam and Philoclean Literary Societies were thoroughly refitted in 1891 and are at present devoted to the needs of the Young Men's Christian Association and the department of history. The second and third floors are occupied by the departments of English and education.

Daniel S. Schanck Observatory (1865)

The observatory, a gift of Daniel S. Schanck, is a two-story brick building with revolving dome. The main part contains the equatorial telescope; on the west side is an extension for transit observations containing the meridian circle.

This building is used in connection with the course in general astronomy to give a knowledge of the sun, moon, planets, etc. Those who elect mathematics and astronomy receive instruction in the use of the instruments and take part in the observations.

The longitude of the observatory is $0^{\text{h}} 10^{\text{m}} 29^{\text{s}}$ east of the New Naval Observatory at Washington, D. C. The latitude is $40^{\circ} 30' \text{ N.}$

Geological Hall (1871)

Besides the department of geology and mineralogy this building also accommodates for the present the department

of physics. The latter occupies six rooms on the main floor and two in the basement. There are two lecture rooms, an apparatus room, a general laboratory, and a laboratory for work requiring even temperature.

The department of geology and mineralogy occupies the rest of the building, which consists of a classroom; a laboratory for determinative mineralogy; an exhibition room, 40 by 84 feet with a gallery, containing the Geological Museum; a combined office and departmental library; and storerooms.

Sophia Astley Kirkpatrick Memorial Chapel (1872)

The chapel was erected with money bequeathed to the College by Mrs. Sophia Astley Kirkpatrick. The building is of brown stone in the French Gothic style of the fourteenth century. With its chancel and gallery it has a seating capacity of about 800, and is used for the daily morning prayers and for the Sunday preaching service. Upon its walls hang the portraits of many of the presidents, trustees, and professors who have in the past served the College. In addition there is, above the chancel, a large window to Dr. J. R. Hardenbergh, the first president of the College; and, in the nave, are found several bronze busts and memorial tablets, with many class windows.

New Jersey Hall (1888-1889)

The erection of this building was authorized by an act of the State Legislature approved April 23, 1888. It affords laboratories and offices for some of the departments of the State and Agricultural College Experiment Stations and, by the courtesy of the Board of Managers of the State station (who also constitute the State Board of Visitors to the Agricultural College), for the laboratories and classrooms of the departments of biology, zoology, and botany.

Winants Hall (1890)

This building was given to the College by Garret Ellis Winants, a trustee of the institution. It provides dormitory accommodations for about ninety and a dining hall for such students as choose board at the College. (See Board and Rooms, page 245.

Robert F. Ballantine Gymnasium (1893)

The gymnasium, the gift of Robert F. Ballantine, a trustee of the College, is a fine specimen of the colonial style of architecture. It affords excellent facilities for physical instruction and exercise and for military instruction and drill.

The front of the building is devoted to the purposes of administration and the rear to the gymnasium and drill room proper. Offices are also provided for the Professor of Military Science, the Director of the Gymnasium, and the College Physician. The combined gymnasium and drill room afford an unobstructed space 100 by 60 feet in dimensions. Suspended from the truss-roof is a running-track 280 feet in length. Space is also afforded for the armory of the cadet corps, a large room is provided for lockers, and another for military equipments. In the basement are four bowling alleys.

Swimming Pool (1914).—An extension of the Robert F. Ballantine gymnasium, 45 by 100 feet, adjoining the main building on the north side, has been completed at a cost of more than \$25,000, the gift of Mrs. Robert F. Ballantine. The extension harmonizes in style with the main gymnasium. On the ground floor is a modern, fully equipped swimming pool, the tank being 75 by 26 feet, with ornamental tiling, and a complete filtering system, insuring, by the use of alum and chlorine, a constant supply of pure

water. The depth of the water in the pool runs from $4\frac{1}{2}$ feet at one end to $9\frac{1}{2}$ feet at the other. Seating capacity is provided for about 250 spectators. The pool is in charge of an experienced swimming teacher. The shower bath room, 15 by 20 feet, provides space for 15 modern fixtures. The second story, 100 by 45 feet, is used as a regular gymnasium floor.

Ceramics Building (1902)

This building contains a commodious laboratory especially adapted and arranged for the purpose of housing the equipment for clay-working and ceramics. The workshop covers nearly 1,700 square feet of floor space, providing an admirable place for the machinery installed. There are also storerooms, kiln rooms, a classroom, and the director's office and laboratory.

Ralph Voorhees Library (1902-1903)

This building, donated by Ralph Voorhees, is built of reddish-brown stone in the general style of Queen's College. There being but few fixed interior walls the stack rooms may be extended indefinitely toward the north and the reading rooms to the east and west without materially affecting the design.

A central rotunda, 37 feet in diameter with a low dome and lighted by a large central skylight, contains the reading tables for periodicals, the card catalogs, and the loan desk. Opening directly out of the rotunda east and west are two wings, 25 by 28 feet each, with elliptical barrel-vault ceilings and lighted on three sides by large windows. Two rooms, one containing the Henry Janeway Weston Memorial Collection of books, engravings, and curios relating to Napoleon I, and the other containing collections of coins

and of books, pamphlets, and articles of historic and local interest, are on the front of the first story. Over these are small rooms for special libraries.

Engineering Building (1908)

This building was erected at a cost of \$70,000, of which amount \$25,000 was given by Andrew Carnegie. The foundations and the rear extensions are built of concrete and the superstructure of brick, and the building is fireproof throughout. It contains 7 classrooms, 5 laboratories, 6 offices for professors, and 3 drafting rooms, one of which accommodates 100 students. It provides ample accommodations for the departments of civil engineering, electrical engineering, and mechanical engineering.

The main structure is three stories high, the first floor being devoted to the uses of the electrical and mechanical departments. The rear extensions, one story in height, furnish accommodations for the mechanical engineering and the dynamo laboratories. On the same level are the high pressure boiler room and the civil engineering laboratory for testing strength of materials. The second floor contains a large lecture room for the use of the three departments and the classrooms and offices of the department of civil engineering. The third floor is devoted exclusively to the drafting work. The design of the drafting rooms is such that the light is abundant and uniformly diffused without glare.

Chemistry Building (1910)

This building, which is occupied wholly by the department of chemistry, is of concrete and brick two stories high with basement.

The first floor provides classrooms, a large lecture room, library, museum, office, private laboratory, and lecture prepa-

ration room. The second floor accommodates the divisions of qualitative and quantitative chemical analysis and comprises two large laboratories with corresponding offices for instructors, two smaller laboratories for special work, laboratory for electrochemical analysis, supply room, balance room, hydrogen sulphide room, etc. The basement provides two large laboratories, one for first-year chemistry and the other for fourth-year chemistry, with balance room, combustion room, dark room, machine room, boiler room, and large storeroom.

Entomology Building (1911)

The Entomology Building, which is about 50 by 30 feet in size, consists of two full stories with attic and basement, and is conveniently located near New Jersey Hall. The walls are of brick, the partitions of hollow tile with plaster board finish, the floors of a fireproof composition, and plumbing and wiring are exposed, thus reducing the danger from fire to a minimum. The building has just been thoroughly renovated.

The first floor provides teaching facilities, including a laboratory room 26 by 28 feet, with modern work tables and equipment. The second floor provides accommodations for the entomological work of the State and College Experiment Stations, including laboratories, technical library, and offices for the State Entomologist, the Entomologist to the Experiment Stations, and scientific assistants in the mosquito and other entomological work of the State.

Provision is made for the extensive collections of the department and the walls are so conserved as to afford the maximum space for storage purposes. Photographic rooms are provided and there is storage room for supplies in the attic and the basement.

John Howard Ford Dormitory (1914)

This, the seventh building on the new northward extension of the campus, erected at a cost of about \$125,000, is the gift of the late John Howard Ford of New York City, a trustee of the College. It is constructed of hard-burned red brick with trimming of white Vermont marble and is designed to accommodate about eighty students. The interior is conveniently arranged in suites of studies and bedrooms. Shower baths and dressing rooms are also provided and the central hall contains a reception room on the main floor. (See Rooms, page 245.)

Boathouse

With funds secured from the students, alumni, and friends of the College a commodious boathouse has been built, conveniently situated for the use of those interested in boating and canoeing.

BUILDINGS ON THE FARM

Short Course Building (1906-1907)

This building, erected by a special appropriation of the State Legislature for the use of the short courses in Agriculture, contains large well-lighted rooms for dairy work in handling milk and cream, for butter making, and for the retail trade; laboratories for milk testing, and for horticulture, entomology, and home economics; recitation rooms, and offices for the instructors.

Poultry Administration Building (1911)

The Poultry Administration Building forms a portion of the equipment of the Poultry Department of the State Experiment Station established by an act of the Legislature of 1911. Its large classroom contains a poultry exhibit and

is arranged for effective instruction. The building has also pathological laboratory, isolation pens, cold storage room, dark room, and offices. The other buildings of the Poultry Department include a large hollow tile incubator cellar, Mammoth brooder house, long laying houses, and several type houses. There are in all 56 laying pens where 1,000 mature birds are wintered. Representatives of twenty breeds of poultry are kept on the plant.

In 1914 a tract of 23 acres was set aside to be developed into an experimental and educational poultry farm. Some of the buildings of the old plant have been removed to the new location, and a complete equipment, comprising over 100 separate pens, for the keeping of 3,000 laying hens, has been installed.

The department is directing the Vineland International Egg Laying and Breeding Contest at Vineland, New Jersey, which begins November first, 1916, and extends over a period of three years. One hundred pens of ten birds each are entered in this contest, an area of about eight acres being reserved for the work.

Greenhouses (1908-1912)

One range of greenhouses, erected in 1908 for instruction work in horticulture, comprises a service building 17 by 60 feet and two sections of glass each 18 by 75 feet. This offers an opportunity for practical exercises in seed testing, seed sowing, transplanting of plants, and other greenhouse work.

During 1911 and 1912 a large range of greenhouses, consisting of a service building, two sections of glass 33 by 150 feet, one section 33 by 75 feet and two sections 8 by 16 feet, was erected for investigational work in floriculture. These demonstrate the latest forms of greenhouse construction and the investigations being conducted in them offer special opportunity for senior students in horticulture.

Agricultural Building (1914)

An appropriation of \$100,000 was made by the New Jersey State Legislature in 1912 for the erection of a building to be used for investigation and teaching work in agriculture. It was completed in October, 1914, and occupied by the departments of the College and Experiment Stations. It is a three-story fireproof structure of brick, concrete, and terra-cotta.

This building contains the administration offices of the Station and of the various departments, besides classrooms and laboratories for station and college work. The third floor is occupied by the departments of soil chemistry and bacteriology, plant pathology, and seed analysis. Large, well-equipped laboratories are at the disposal of each department. On the second floor the departments of botany and agronomy have their offices and laboratories. The agricultural library containing sets of state and government publications, herd books, books on various agricultural subjects, agricultural periodicals, and scientific magazines, furnishes a useful and convenient place for reference. These facilities, with laboratories for soil physics, soil analysis, and horticulture, and a large auditorium, with a seating capacity of about 600, make the building well-suited for the efficient performance of college and experiment station work.

Dairy Barn

A modern two-story dairy barn was completed in 1913. This building provides stable room for 40 milking cows and storage for 100 tons of hay. It is simple, sanitary, and convenient, and embodies the essential characteristics of a well constructed dairy barn. This barn, together with the dairy herd, is a part of the equipment of the Dairy Department of the Experiment Stations.

Other Buildings

Other buildings have been erected for use in the short courses, including a pavilion 60 feet in diameter for exhibiting and judging the various breeds of live stock; also a carpentry shop, stables, dairy buildings, silos, poultry houses, greenhouses, tool houses, and storage rooms.

COLLECTIONS AND EQUIPMENT

COLLEGE LIBRARY

THE LIBRARY contains 86,759 volumes and about 20,000 pamphlets and receives about 400 periodicals. It is open each week-day except Saturdays and holidays, from 8 a. m. to 10 p. m., Saturdays from 8 a. m. to 6 p. m.; holidays from 8 a. m. to 12 m. Students are allowed free access to the books and are encouraged to become familiar with the proper methods of using a library for literary work.

In 1887 P. Vanderbilt Spader of the class of 1849 gave to the College his personal library, valued at \$15,000 and consisting of about 5,000 books, among them many valuable art volumes and collections especially rich in State and local history and books of reference. By his will the College received \$10,000, the income of which is expended for the maintenance and increase of the P. Vanderbilt Spader Library Gift.

By the gift of a permanent fund of about \$10,500 from the Honorable Robert H. Pruyn, supplemented by gifts from other sources, the Library is supplied with the leading periodical publications in the various departments.

A valuable private library of about 1,800 volumes and the sum of \$5,000, known as the Benjamin Stephens Fund, for its maintenance and increase, were left to the College by the will of the late Benjamin Stephens of the class of 1844.

The James B. Laing Collection, consisting of valuable and rare coins, together with many other specimens of coins, paper money, and medals presented to the College by various donors, is also housed in the Library and is on exhibition in glass cases.

SAGE LIBRARY

Through the courtesy of the Theological Seminary of the Reformed Church the Sage Library, containing about 53,000 volumes and 8,000 pamphlets, is open to students of Rutgers College for consultation during each week-day from 9 a. m. to 12:30 p. m., 2 p. m. to 4:30 p. m., 7:30 p. m. to 9 p. m.; and under certain limitations books may be drawn from it.

HISTORY OF ART

The Fine Arts Room contains some of the art collections of the College, including The Thomas L. Janeway, M.D., Memorial Collection of casts and photographs. This latter collection, intended to illustrate classical archeology, is the gift of the heirs of Thomas L. Janeway, M.D., of the class of 1863. The room contains:

1 Casts from marbles typical of the chief periods in the history of sculpture.

2 Five hundred casts from engraved gems (cameos and intaglios) and coins, Greek and Roman. These were selected to illustrate the historical development of gem engraving especially in its best periods.

3 Fifteen hundred stereopticon slides of architecture, sculpture, and painting.

4 Fifteen hundred photographs of drawings, sketches, pictures, marbles, and buildings.

5 Many framed photographs and engravings.

6 Several oil paintings and water-color drawings.

The collections are used continually in lectures to illustrate not only the art of the different nations but their life, literature, and social culture.

The room is arranged for the illustration of lectures with both transparent and opaque lantern materials.

HISTORY

The Henry Janeway Weston Memorial Collection, consisting of books, engravings, and curios relating to Napoleon I, is deposited in a room in the Ralph Voorhees Library and is available for the use of students. This valuable collection was given by Mrs. Katherine Weston, who also furnished the room and bequeathed a fund for its maintenance.

ASTRONOMY

The equatorial refracting telescope, with an aperture of $6\frac{1}{2}$ inches, has a driving clock, a position micrometer, a number of eye pieces of various powers, ranging from 50 to 600, and a solar attachment for the study of sun spots. The declination circle is 10 inches in diameter, reading by verniers to 1 minute of arc, and the hour circle, $7\frac{1}{2}$ inches in diameter, reading by verniers to 6 seconds of time.

The meridian circle used for transit observations was made by

Stackpole of New York. It has an object glass 4 inches in diameter and circles 17 inches in diameter reading by two microscopes with micrometer screws to single seconds of arc.

The Observatory has also a sidereal clock, a chronograph, a mean solar clock, and a reflecting circle.

PHYSICS

The lecture apparatus comprises the usual instruments. The laboratory contains general apparatus such as dividing engine, a set of United States standard weights and measures, metric standards, spherometer, planimeter, etc.; various optical instruments, including a spectrometer and optical bench with full set of accessories; the necessary apparatus for experiments in heat, including calorimeters, thermoelectric pyrometer, steam engine, gasoline engine, and Callendar apparatus; also a full set of electrometers, galvanometers, rheostats, dynamos, motors, telephones, and telegraph instruments.

The reference books most frequently consulted are kept in the department ready for instant use.

CIVIL ENGINEERING

The collections for illustrating the instruction given in the civil engineering course comprise a great variety of models showing details of construction in wood, iron, and stone, with a full set of Schröder and many Olivier models in descriptive geometry, besides blue prints, working drawings, and lithographs of roof and bridge trusses. There are also instruments of precision for various uses such as planimeters, pantagraphs, sextants, and elipsography. Complete outfits of engineering and surveying instruments are provided for the use of students in the surveying classes.

A laboratory for testing cement and concrete is fitted up in the basement of the Engineering Building. It is equipped with long lever and shot testing machines, steaming and boiling apparatus, damp closet, autoclave apparatus, mechanical rotary sieve, 20 glass mixing tables, a special apparatus for testing the porosity of cements, and a full line of tools and apparatus. Machines have been installed for testing the tensile, compressive, transverse, and torsional strength of other engineering materials; and pumps, tanks, meters, and weirs for hydraulic experiments are also available.

ELECTRICAL ENGINEERING

The electrical laboratory is provided with two 15 horsepower direct current constant speed motors, a 7.5 horsepower adjustable speed motor, a 6 kw. Edison direct current dynamo, a 6 horsepower Edison shunt motor, a 4 kw. Crocker-Wheeler compound dynamo, a 5 horsepower Crocker-Wheeler series motor; a Fort Wayne double current generator which can be used to furnish either direct current or single-phase, three-phase, and quarter-phase alternating current, or to convert from alternating current to direct current or vice versa; two General Electric 7.5 kw. revolving field polyphase alternators specially designed for laboratory use, a two-phase alternator designed and built by one of the students, a 4 horsepower polyphase synchronous motor, a 5 horsepower two-phase induction motor with auto-starter; transformers of various types and capacities, brake and transmission dynamometers, the usual outfit of commercial measuring instruments, an electro-dynamo-meter, galvanometers of various types, a Kelvin double bridge, a Leeds and Northrup standard Wheatstone's Bridge, and a Leeds and Northrup standard potentiometer for standardizing measuring instruments; standards of electromotive force, of resistance, of self-induction, and of capacity, an Ayrton-Perry secohmmeter, an Epstein hysteresis meter, and a large assortment of resistance boxes and other apparatus.

MECHANICAL ENGINEERING

The equipment provided for this course belongs chiefly to the laboratory, with emphasis upon power engineering. The list of instruments and small apparatus includes pressure gages, engine indicators, draft gages, thermometers, pyrometers, steam calorimeters, water meters, speed indicators, etc., with provision for testing and calibrating them, also apparatus for flue-gas analysis and for the testing of lubricants.

The principal items of large equipment now in place are:

A Babcock and Wilcox boiler, rated at 135 horsepower, with all accessories, including forced draft apparatus and Cochrane feed-water heater, and especially arranged for the convenient conduct of boiler trials.

A 60 horsepower high speed Ames engine direct connected to a 35 kilowatt Crocker-Wheeler generator. This unit besides being available for testing takes the regular service of supplying current for the dynamo laboratory.

A small De Laval steam turbine with a centrifugal pump, steam pumps, injectors, and a pulsometer. With these pumps a cistern of 5,500 gallons capacity is provided under the floor, and tanks, meters, and a weir, for measuring the water handled.

An Ingersoll-Rand air compressor, and a Westinghouse compressor (air brake type).

Surface condensers and accessories for making steam consumption tests on all the engines.

Several gas engines for illuminating gas and liquid fuels.

The hydraulic apparatus belonging to the department of civil engineering is mostly installed in this laboratory, and is used for work in the senior mechanical laboratory course.

A shop outfit is being developed for bench, lathe, planer, drill and milling machine work, also for light forging and tool making and treatment.

CHEMISTRY

The department occupies the whole of the Chemistry Building. The laboratories, four large well lighted rooms, are fitted in the most modern manner to the end for which each is designed. Work tables, balance rooms, and small special laboratories, all supplied with every convenience for facilitating work, are placed at the disposal of the students. The installation of a complete new ventilating system insures a constant supply of fresh air.

The various classrooms are arranged with many devices for making practical demonstrations in the courses covered and new and special pieces of apparatus are being constantly acquired for such demonstrations and investigations.

GEOLOGY AND MINERALOGY

The Museum.—The Geological Museum contains about 30,000 classified and labeled specimens, including about 13,000 mineral specimens, 2,000 rock specimens, and 6,000 fossils, besides collections in several related sciences. These furnish abundant illustrative material for instruction in geology and mineralogy. The chief systematic collections, most of which are on exhibition in glass cases, are as follows:

- 1 The Cook collection of minerals, about 5,000 specimens.
- 2 The Beck collection of minerals, 3,000 specimens collected by Dr. Lewis C. Beck between 1820 and 1850, chiefly in the State of New York.

- 3 The Chester collection of minerals, about 5,000 specimens, very many of them perfect typical specimens.
- 4 The Geological Survey collection containing nearly 1,000 specimens of rocks, minerals, and ores of New Jersey.
- 5 A lithologic and structural series of about 2,000 specimens.
- 6 The "Educational Series" of 156 typical American rocks prepared and presented by the United States Geological Survey.
- 7 A collection of about 6,000 fossils arranged in geologic sequence.

There are also several smaller collections and a number of large single specimens of considerable value. Prominent among the latter are the magnificent mounted skeleton of mastodon from Mannington Township, Salem County, New Jersey, believed to be the largest yet discovered, and the slab of Triassic sandstone, 8 by 18 feet, from Morris County, New Jersey, showing numerous reptilian footprints.

Illustrating related sciences and worthy of special note are: the Frazee collection of about 1,700 paleolithic and neolithic implements, ornaments, etc.; a conchological collection containing over 1,600 recent shells; and the Cuthbert botanical collection containing a great number of native and foreign plants. Various large single specimens include a Japanese spider crab (*Macrocheirus camperi*) which has a span of 11 feet, and the skeleton of a right whale 42 feet long caught in the Raritan River.

Laboratory and Classroom Equipment.—For instruction in geology, besides the extensive collections of the Museum, a large number of geologic and topographic maps, a set of physical wall maps, and several hundred lantern slides and photographs are provided. A powerful projection apparatus, adapted to the projection of opaque and microscopic objects, as well as lantern slides, is installed in the classroom.

The mineralogic laboratory is supplied with the usual apparatus and reagents for the study of the physical and chemical properties of minerals, a great variety of material for practice in the determination of unknown specimens, an assortment of glass and wood crystal models, a Zeiss stereobinocular microscope, a Fuess petrographic microscope, and several hundred thin sections of rocks and the rock-forming minerals.

Libraries.—A departmental library of about 1,500 volumes is available for reference and advanced study in the elective courses. The geologic department of the College Library receives regularly the publications of the geological surveys of the various states and of the United States, besides many similar publications of other countries

and the leading periodicals relating to geology, mineralogy, and mining. It has also been greatly enriched by the addition of the private libraries of the late Professors George H. Cook and Albert H. Chester.

CLAY-WORKING AND CERAMICS

The equipment of the laboratory is extensive, consisting of machinery for the manufacture of brick, tile, and pottery, as well as apparatus for the physical and chemical testing of clays and other raw materials.

The brick-making outfit consists of a large auger brick machine and a small experimental auger brick machine, a horizontal pug-mill, a dry-pan, which may also be used as a wet-pan, and a down-cut board-delivery table. The tile and the pottery machinery include a miniature slip-house plant, having a blunger, agitator, lawn-screen, slip-pump, and filter-press with a capacity of 500 to 1,000 pounds a day, a four-jar glaze-mill, large and small ball-mills, a potter's wheel, a combination jigger and pull-down, a potter's pug-mill, a hand-jigger, a reversible bench-lathe, a tile-press, a wad-machine, bench-whirlers, and other necessary appliances, all of the latest design and representative of the types of construction used in the manufacture of a wide range of wares.

Two large coal-burning and two smaller oil-fired kilns have been provided for the burning of the test pieces and ceramic wares made in the laboratory. Frit furnaces are available for the preparation of glazes. The softening points of clays and refractories are determined in a Deville furnace and pot-furnaces fired with gas and air under pressure. Thermocouples and galvanometers of approved make have been provided for the control of the firing and the study of the phenomena associated with high temperatures.

The library of the department, which is a collection of the more important technical literature relating to ceramics, is kept in the classroom where it is accessible to the student. It comprises periodicals, both current and bound numbers, and books from French, German, English, and American sources.

A collection of ceramic wares is also in process of installation.

AGRICULTURE AND BIOLOGY

These departments, including agriculture, botany, entomology, physiology, and zoology, have an equipment for purposes of instruction consisting of the following:

- 1 *College Farm*.—The barns have been built with a view to convenience and economy of space. The equipment is of the most

modern type, including all of the necessary tools and implements required for farm practice. The live stock includes representatives of the leading breeds of horses, dairy cattle, swine, and poultry.

On the farm the intensive system is practiced; it includes soiling, green manuring, and all the natural and artificial aids necessary in continuous cropping to secure maximum yields. A special study is made of forage crops for the dairy and all the leading crops in this group are grown. The farm is on the whole an object lesson not only in modern and profitable practice but in showing the economical manufacture of crude crop material into high class products, such as milk and cream, for which all the modern appliances are used.

On the experimental areas the leading varieties of fruits, berries, and vegetables are grown and scientific methods of fertilizing, manuring, and cultivating are used. The plant houses, used primarily for experimentation in soils and the forcing and breeding of plants, afford opportunity for students to observe the behavior of plants under glass.

Models of farm buildings illustrating the best methods of construction besides those illustrating various interior arrangements, such as stalls for horses and cattle, are available for instruction.

2 *Laboratories.*—Separate rooms for botany, plant pathology, and bacteriology, for entomology, for zoology and for physiology have been equipped with tables, accessory microscopic apparatus, histological reagents, microtomes, material for dissection, 100 compound microscopes (Bausch and Lomb's, Reichert's, Voigtländer's, Spencer's, and Leitz's), giving powers up to 1,500 diameters, and also with many dissecting microscopes.

3 *Auzoux and plaster models* illustrating the structure of man, horse, cow, bird, reptile, fish, snail, starfish, ascidian, medusa, worms, insects (cockchafer, silkworm larva and moth, honey-bee and its work), and plants (various flowers, fruits, and fungi).

4 *Charts* (including all of Leuckart's) illustrating the various parts of the living world, also many photographs and lantern slides.

5 *Cabinets.*—A collection of slides illustrating histology and the anatomy of minute animals, especially the insects; a collection of 5,000 species of insects systematically arranged; also a collection of nearly 25,000 plants.

6 *Museums.*—A collection of stuffed animals, skeletons, and alcoholic specimens systematically arranged; 60 large boxes containing a collection of injurious insects and examples of their work; a systematic collection of over 5,000 species of American insects; preparations of pathological plant specimens; a collection illustrating the

biology of the oyster, its messmates and enemies; and a fine systematic collection in conchology.

7 *Experiment Stations.*—Besides the equipment for direct instruction the student has brought under his observation the equipment of the research laboratories of the Agricultural Experiment Stations in working operations, such as the instruments used in the study of milk, soils, fertilizers, bacteria, mycology, photomicrography, insecticides, fungicides, and in other experiments relating to agriculture.

8 *The Hulst Collection.*—The Hulst Collection of *Lepidoptera* represents the life work in entomology of the Reverend George D. Hulst, PH.D. It consists of two parts: the first, a general collection of butterflies and moths, was presented to the College in 1890 and was received and cared for soon afterward by the Professor of Entomology; the second part, though included in the original gift, was retained by the donor during his lifetime and increased in value by the scientific labor on it. This came into the possession of the College in 1901 and contains 1,217 species, of which 549 are types of descriptions written and published by Doctor Hulst, in 3,830 specimens. In the families studied by him this collection is without a peer. Exclusive of these special families there are in the first part 828 species, including twelve types, in 2,775 specimens. The entire collection thus contains 2,195 species, 561 types, and 6,605 specimens.

9 *The Smith Collection.*—The Smith Collection of *Lepidoptera* represents the work done by the late Professor John B. Smith during his connection with Rutgers College. The collection is especially rich in the family of noctuid or owlet moths, where at the latest enumeration 1,683 species (348 of them types) were represented by 8,930 specimens,—figures which have been since materially increased. In addition there are numerous unarranged and undescribed species and a large series of species in other families. Altogether there are not less than 2,000 species and over 12,000 specimens.

It is fair to estimate the entire college collection of *Lepidoptera* included in the Hulst and Smith collections as exceeding 4,200 species and closely approaching 20,000 specimens. Not more than three or four collections in the United States exceed this in scientific value.

SHORT COURSES IN AGRICULTURE

The agricultural buildings contain a large library and reading room well supplied with the best agricultural books, periodicals, and bulletins. There are classrooms, laboratories, and offices, a stereop-

ticon and facilities for giving illustrated lectures both day and evening. The soil laboratory is fully equipped with experimental apparatus. The dairy laboratories have all the modern dairy apparatus: separators, sterilizers, coolers, refrigerator, churns, butter-workers, bottlers, bottle-washers, boiler and engine, Babcock machines, and all apparatus for testing milk and its products. A room for shop practice is provided with benches, carpentry tools, and pipefitting tools.

The horse stables and dairy barns serve for illustrating methods of building and arranging of stalls and of handling feed and litter. Three silos illustrate the relative value of the large and small silos for the use of a herd of varying size; besides, the daily feeding of the various kinds and ages of animals is a practical illustration of the preparation and use of balanced rations. There are, in addition, models of farm buildings and stalls for dairy cattle.

The cattle owned by the College consist of specimens of the four leading dairy breeds: Holstein, Jersey, Guernsey, and Ayrshire. The breeds of swine include specimens of the Berkshire, Duroc-Jersey, Chester White, Poland China, Large Black, and Yorkshire. Good types of draft, farm, and carriage horses are also available for instruction. Special attention is given to market types. A heated pavilion, 60 feet in diameter, is used for judging and exhibiting the various breeds of live stock.

The equipment for the course in Poultry Husbandry includes a poultry farm of 8 acres, located on the agricultural campus, which is equipped with modern buildings and complete apparatus for extensive laboratory operations. On this plant there are 56 pens, containing representatives of 20 breeds of poultry, totaling approximately 1,000 birds. A modern hollow tile incubator cellar has been provided with Mammoth incubators and the testing room is a valuable feature of the equipment. Six types of commercial brooders are available for the use of the students, including an intensive brooder house with centralized heating plant, 125 feet long.

The Poultry Administration Building, located in the center of this plant, provides large classroom, exhibits, demonstration material and equipment for complete instruction in poultry husbandry. The poultry department also maintains a 23-acre poultry farm about one-half mile from the educational plant. This is open at all times for inspection by students and much is gained by their having an opportunity to keep in touch with the research and commercial operations. The new farm contains 100 laying pens and has a capacity of approximately 3,000 birds.

The equipment for the course in Fruit Growing and Market Gardening includes a range of greenhouses of the latest modern construction, where practical exercises are given in seed testing, seed sowing, transplanting of plants, the propagation of plants, etc. Practical and experimental floriculture is also carried on in these and other greenhouses.

Various types of farm machines, engines, garden implements, seed drills, cultivators, hand weeders, dibbers, etc., are on exhibition during the course.

For the practical exercises in fruit growing the equipment includes fruit trees of the various grades as sold by nurserymen; various types of pruning shears, saws, pruning hooks, hand pruners, budding, grafting, and pruning knives; a collection of fruit packages; hand sprayers, barrel pumps, spray nozzles, hose, rods, and other spraying attachments.

For the use of the students taking the course in Home Economics the department is equipped with home cooking ranges, hot and cold water, cooking utensils, sewing machines, drafting, cutting and sewing tables, dining service, and laundry utensils.

AGRICULTURAL EXPERIMENT STATIONS

STATE STATION—ESTABLISHED 1880

Staff

JACOB G. LIPMAN, Ph.D., Director
IRVING E. QUACKENBOSS, Secretary and Treasurer
THOMAS J. HEADLEE, Ph.D., Entomologist
CHARLES S. CATHCART, M.Sc., Chemist
MAURICE A. BLAKE, B.Sc., Horticulturist
FREDERICK C. MINKLER, B.S.A., Animal Husbandman
HARRY R. LEWIS, M. Agr., Poultry Husbandman
ALVA AGEE, M.S., Chief of the Extension Department
JOHN P. HELYAR, M.S., Seed Analyst
WILLIAM J. CARSON, B.S.A., Dairy Husbandman
FRANK APP, B.S., Agronomist
CARL R. WOODWARD, B.Sc., Editor

Associate and Assistant Staff

In Horticulture

Charles H. Connors, B.Sc.
Arthur J. Farley, B.S.
Lyman G. Schermerhorn, B.S.
Ralph M. Hubbard, B.Sc.
David Schmidt, B.Sc.
Herman J. Levine, B.Sc.
W. Raymond Stone
Louis A. Ruzicka
Paul J. Sassi

In Poultry Husbandry

Willard C. Thompson, B.S.
Roy F. Irvin, B.S.
Morris Siegel
Elmer Wene
William Pape
Victor G. Aubry
James G. Rugh

In Chemistry

Ralph L. Willis, B.Sc.
Frank O. Fitts, B.Sc.
D. James Kay, B.Sc.
Archie C. Wark
W. Andrew Cray
Herbert P. Rood

In Animal Husbandry

J. Marshall Hunter, B.S.

In Farm Crops

Charles S. Van Nuis
James W. Day, A.M.

In Seed Analysis

Nevada S. Evans, A.M.

In Entomology

Charles S. Beckwith, B.Sc.

In Cranberry Investigation

Fidel P. Schlatter, B.S.

In Soil Fertility

Harry C. McLean, M.Sc.

In Dairy Husbandry

Lloyd S. Riford, A.M.

In Oyster Investigation

Thurlow C. Nelson, B.Sc.

AGRICULTURAL COLLEGE STATION—ESTABLISHED 1888

Staff

JACOB G. LIPMAN, Ph.D., Director; Soil Chemist and Bacteriologist

HENRY P. SCHNEEWEISS, A.B., Chief Clerk

BYRON D. HALSTED, Sc.D., Botanist

THOMAS J. HEADLEE, Ph.D., Entomologist

MELVILLE T. COOK, Ph.D., Plant Pathologist

Associate and Assistant Staff

In Botany

John W. Shive, Ph.D.

Earl J. Owen, M.Sc.

Orville C. Schultz, B.Sc.

John V. Piper, B.Sc.

Mathilde Groth

**In Soil Chemistry and
Bacteriology**

Augustine W. Blair, A.M.

Louis K. Wilkins, B.Sc.

Roland E. Curtis, B.Sc.

James R. Neller, M.Sc.

In Entomology

Alvah Peterson, Ph.D.

Augusta E. Meske

In Plant Pathology

Webster S. Krout, M.A.

William H. Martin, B.A.

The New Jersey Agricultural Experiment Station was established by State law in 1880 "for the benefit of practical and scientific agriculture and for the development of our unimproved lands." It was located in connection with the State Agricultural College at New Brunswick, and its management was committed to a Board of Directors consisting of the Governor of the State, the Board of Visitors of the State

Agricultural College, and the President and Professor of Agriculture of the College.

The broad spirit of public service that has animated the institution from its inception is well expressed in the words of the first notice, issued April 7, 1880: "The New Jersey Agricultural Experiment Station was established for the purpose of promoting agriculture by scientific investigation and experiment * * * to give information on various subjects of agricultural science for the use and advantage of the citizens of New Jersey. It is the wish of the Board of Direction to make the Station as widely useful as its resources will admit. Every New Jersey citizen who is concerned in agriculture, whether farmer, manufacturer, or dealer, has the right to apply to the Station for any assistance that comes within its province to render, and the Station will respond to all applications as far as lies in its power."

The Agricultural College Experiment Station was founded in 1888 under laws of Congress and of the State, and was placed under the direction of the Trustees of Rutgers College. Its purpose is "to aid in acquiring and diffusing among the people * * * practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science."

The College Station is an organic branch of the State Agricultural College and the State Station is also closely affiliated with it. Experiments and investigations are continually in progress in every department, and many members of the scientific staffs devote their whole time to such work. The results are published in the form of bulletins and annual reports which are sent free to residents of the State who make application for them.

Some of the activities of the Station concern fertilizers and manures, soil fertility and soil biology, the composi-

tion of feeding stuffs, milk production, dairy feeding, the breeding of dairy stock, poultry raising, fruit growing, vegetable growing, farm crops, farm management, seed control, floriculture, plant diseases, plant breeding, and the development and selection of plant varieties, oyster propagation, insect pests and insecticides, and mosquito extermination.

In cooperation with the State Geological Survey and the United States Bureau of Soils, a soil survey is now in progress in which the soils of the entire State are being studied and mapped in detail. Apiary inspection and nursery inspection are also carried on in cooperation with the State Board of Agriculture.

EDUCATIONAL WORK

The Experiment Stations conduct an extensive correspondence on agricultural topics, averaging about 100,000 letters a year, besides giving personal advice to numerous visitors and through the personal visits of members of the staff to farms in all parts of the State. The work and methods of the Stations are also shown by exhibits at agricultural fairs and by cooperative and demonstration experiments in various sections of the State.

In order to facilitate and strengthen this work a Department of Agricultural Extension has been organized. It is concerned with all the problems of rural communities, but its primary purpose is to carry to the people of the State the results of agricultural research and a knowledge of the best agricultural practice. A corps of specialists has been provided and numerous demonstrations have been conducted in various counties of the State to show the value of fertilizers, the relative productiveness of seed used by farmers in different localities, the control of certain plant

diseases, the practical methods of spraying orchards, packing fruit, etc.

The head of this department acts as State superintendent of farm demonstration under the law which provides for the appointment of a county superintendent in every county. The assistant chief conducts the farmers' institutes for the State Board of Agriculture, at which lecturers explain and demonstrate the best methods of farm practice. As far as possible the department responds to requests for speakers on agricultural topics at gatherings of all kinds throughout the State.

In order to meet as fully as possible the numerous inquiries for information along every line of practical agriculture the Extension Department issues a series of circulars on special topics prepared by members of the staff and other specialists. The total number of such circulars at present is about fifty.

A *Field Day* for farmers is usually held at the College Farm in August or September.

During the week between Christmas and New Year's Day conferences and meetings on rural life problems are held on the College Campus and at the College Farm. Special programs are then arranged for members of boys' and girls' clubs in New Jersey.

AGRICULTURAL EXTENSION WORK

DIVISION OF EXTENSION IN AGRICULTURE AND HOME ECONOMICS

Staff

ALVA AGEE, M.S., Director

JOHN H. HANKINSON, A.B., State Leader of County Demonstration

J. B. R. DICKEY, B.Sc., Extension Specialist in Agronomy

ALLEN G. WALLER, B.Sc., Assistant Extension Specialist in Agronomy

ROSCOE W. DEBAUN, B.S., Extension Specialist in Market Gardening

———, Extension Specialist in Markets

LAWRENCE G. GILLAM, B.Sc., Extension Specialist in Fruit Growing

HARRY C. HAINES, Assistant Extension Specialist in Fruit Growing

VICTOR G. AUBRY, B.S., Extension Specialist in Poultry

JOHN W. BARTLETT, B.Sc., Extension Specialist in Dairy Husbandry

WILLIAM H. McCALLUM, B.Sc., State Leader in Boys' Club Work

CARL R. WOODWARD, B.Sc., Editor

M. ANNA HAUSER, B.S., Extension Specialist in Home Economics

FANNIE F. COOPER, B.S., State Leader in Girls' Club Work

HELEN E. MINCH, Assistant in Girls' Club Work

PAUL B. BENNETCH, B.S., County Demonstrator for Sussex County

WILLIAM H. HAMILTON, B.Sc., County Demonstrator for Mercer
County

W. B. DURYEE, B.S., County Demonstrator for Monmouth County

L. F. MERRILL, B.S., County Demonstrator for Bergen County

ELLWOOD DOUGLASS, County Demonstrator for Atlantic County

GEORGE B. THRASHER, County Demonstrator for Cape May County

IRVING L. OWEN, B.Sc., County Demonstrator for Middlesex County

GEORGE T. REID, County Demonstrator for Burlington County

WARREN W. OLEY, B.S., County Demonstrator for Cumberland County

A. M. GOODMAN, B.S., County Demonstrator for Morris County

ELLWOOD L. CHASE, B.S., County Demonstrator for Passaic County

A Department of Agricultural Extension in the New Jersey State Experiment Station was organized December 1, 1912, to carry the results of station research to the people

of the State. The State Legislature enacted a law in 1913 providing for farm demonstration, and it makes appropriation for this work. The work of the Department of Agricultural Extension in the Experiment Station was co-ordinated with that of a Division of Extension in Agriculture and Home Economics in the State College of Agriculture July 1, 1914, the creation of the college division having been made necessary by the terms of the so-called Smith-Lever act of Congress, approved May 8, 1914, which made an appropriation to the State of \$10,000 to carry out the provisions of the act.

The purpose of the Smith-Lever act is "to aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture and home economics, and to encourage the application of the same." It provides for extension work to be inaugurated in connection with the land-grant colleges of the states and to be carried on in cooperation with the United States Department of Agriculture. "That cooperative agricultural extension work shall consist of the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said colleges in the several communities, and imparting to such persons information on said subjects through field demonstrations, publications, and otherwise; and this work shall be carried on in such other manner as may be mutually agreed upon by the secretary of agriculture and the state agricultural college or colleges receiving the benefits of this act."

"That for the purpose of paying the expenses of said cooperative agricultural extension work and the necessary printing and distributing of information in connection with the same, there is permanently appropriated, out of any money in the treasury not otherwise appropriated, the sum of \$480,000 for each year, \$10,000 of which shall be paid

annually, in the manner hereinafter provided, to each state which shall by action of its legislature assent to the provisions of this act."

The Smith-Lever act further appropriates for the benefit of all the states "an additional sum of \$600,000 for the fiscal year following that in which the foregoing appropriation first becomes available and for each year thereafter for seven years a sum exceeding by \$500,000 the sum appropriated for each preceding year, and for each year thereafter there is permanently appropriated for each year the sum of \$4,100,000 in addition to the sum of \$480,000 hereinbefore provided.

. . . Such additional sums shall be used only for the purposes hereinbefore stated and shall be allotted annually to each state by the Secretary of Agriculture and paid in the manner hereinbefore provided, in the proportion which the rural population of each state bears to the total rural population of all the states as determined by the next preceding federal census; provided further that no payment out of the additional appropriations herein provided shall be made in any year to any state until an equal sum has been appropriated for that year by the legislature of such state or provided by state, county, college, local authority or individual contribution from within the state, for the maintenance of the cooperative agricultural extension work provided for in this act."

The annual appropriation to the State of New Jersey through this act will become \$62,000 seven years hence, provided an equal amount is available at that time from State, county, and other sources.

The work of the division is carried on by means of specialists and county superintendents of farm demonstration. The specialists assist the county superintendents of farm demonstration in organized counties of the State and carry on demonstration work in other counties upon the request of

associations and individual farmers. They respond to requests for addresses as far as practicable and make replies to many thousands of inquiries annually by letter.

The county superintendents of farm demonstration are appointed by the board of managers of the State Experiment Station upon the recommendation of the State Superintendent of Farm Demonstration, who is also Director of the Extension Division. A State law enacted in 1913, making provision for farm demonstration, empowers county boards of freeholders to make appropriations for the support of these county superintendents. It is the policy of the State to make such an appointment only after petitions have been received bearing the names of a large number of the leading farmers of the county. The efficiency of the work in organized counties attests the wisdom of the legislation providing for it.

GENERAL INFORMATION

STUDENT GOVERNMENT

For purposes of self-government the whole student body is organized as a Student Assembly with a constitution and by-laws. This assembly chooses annually a Senior Council, which acts as an executive committee of the Assembly, holding regular meetings throughout the year, and proposing to the Assembly appropriate rules for the government of student order and college customs.

Offenses against good order are tried by a permanent board consisting of four seniors, four juniors, two sophomores, and two freshmen, chosen by their respective classes, with the Dean as presiding officer.

Student Self-Government Board for 1916-1917

DEAN LOUIS BEVIER, *Ex Officio*

DAVID G. ACKERMAN '17	WILLIAM N. PACKARD '18
WILLIS P. DURUZ '17	CHARLES L. WALKER '18
HAROLD I. FAWCETT '17	DONALD H. DAVENPORT '19
CLIFTON H. LUSTER '17	KENNETH RENDALL '19
J. BLANCHARD DURAND '18	WILLIAM G. GRAY '20
JOSEPH H. EDGAR '18	WILLIAM M. HADDEN '20

Senior Council for 1916-1917

FREDERICK B. HEITKAMP, *Chairman*

J. KINGSLEY POWELL, *Secretary*

PAUL M. BOWEN	ROBERT V. E. MARTIN
RUDOLPH ELMER	FRANCIS J. SCARR
IRVING R. TROLL	

ATTENDANCE AT EXERCISES

Students are required to attend morning prayers each week-day, except Saturday, at 8.20 o'clock, and Sunday morning services at 11 o'clock in the Kirkpatrick Chapel.

Recitations, except the first, which immediately follows morning prayers, begin at 5 minutes past the half-hour. Students entering the classroom late are marked tardy up to 20 minutes past the half-hour; those not present at this time are marked absent.

Attendance is required at all scheduled exercises, unless the student is specifically excused. Excuses are granted in the discretion of the Dean, and in cases where it is possible must be applied for in advance.

Excuses for absences not to be accounted cuts must be presented to the Registrar, in advance if the absence is anticipated, and in other cases before 4 p. m. of the college day following the absences.

All unexcused absences are reckoned as cuts, subject to the following penalties:

(a) If the number of cuts in any course or prescribed exercise does not in any term exceed the term-hour rating of the course or prescribed exercise, the student will receive a warning only.

(b) If the number of cuts in any course or prescribed exercise exceeds in any term the term-hour rating of the course or prescribed exercise, the student will, in the case of absences from morning chapel or from Sunday service be subject to suspension, and in the case of study courses or exercises a pro rata deduction from the grade assigned to his term work will be made, on the basis of zero for each excess cut.

(c) If the number of cuts in any course exceed in any term twice the term-hour rating of the course, the student will be excluded from the examination and required to repeat the course.

Absences due to exclusion from college for delayed essays or speeches are reckoned as cuts.

Absences, due to disciplinary suspension, if the work

omitted has been satisfactorily made up by an appropriate test within the prescribed time limit, are not reckoned as cuts, but the student is subject to a pro rata deduction from the grade assigned to his term work on the basis of a passing grade only for the omitted work. If the work omitted in any course has not been satisfactorily made up within the prescribed time limit, the student is excluded from the examinations and required to repeat the course.

All absences extending beyond three consecutive sessions in any course may be made up by an appropriate test in the discretion of the instructor concerned. For the work omitted in absences of less extent the student is held responsible, but special tests or recitations are not offered.

A tardiness at any exercise counts as half an absence.

EXAMINATIONS AND REPORTS

Regular examinations are held twice a year—at the close of each term. Unannounced tests are held at irregular intervals at the discretion of each instructor.

Students are graded on the scale of 100. A combination of three-fourths of the class mark in any study with one-fourth of the examination grade gives the term grade.

All grades are reported to the Registrar, who designates them by letters according to the following table:

<i>Grade</i>	<i>Letter</i>
90 to 100	A
80 to 89	B
70 to 79	C
60 to 69	D

The minimum passing grade is 60.

Below 60 in term grade	E
Below 60 on examination	F
Incomplete term record	G
Absence from examination	H

Grades are reported to students and their parents or guardians by means of these letters only. The student's standing in all studies is made up and reported in this manner at the end of each term.

The minimum passing grade is 60 and any lower standing in either term grade or examination constitutes a deficiency that must be removed by reexamination.

Reexaminations for the removal of deficiencies are held at stated periods, and a student who fails to pass one of these will be given another opportunity by special permission and upon payment of a fee of \$5. The second reexamination can be taken only in September.

COLLEGE FEES

The dues of each term must be paid within ten days after the opening of the term:

In addition to the regular fees all breakage and damage to college property will be charged in full.

Fees for Undergraduate Students

	One Term	One Year
Admission or Registration Fee, payable once.....	\$5.00
Tuition Fee.....	\$50.00	100.00
Public Room Service.....	20.00	40.00

After the freshman year students are required to pay additional fees in accordance with the following schedule:

	One Term	One Year
Course in Agriculture.....	\$15.00	\$30.00
Course in Astronomy.....	15.00	30.00
Course in Bacteriology.....	15.00	30.00
Course in Biology.....	15.00	30.00
Course in Botany.....	15.00	30.00
Course in Ceramics.....	15.00	30.00
Course in Chemistry.....	15.00	30.00
Course in Civil Engineering.....	15.00	30.00
Course in Electrical Engineering.....	15.00	30.00

	One Term	One Year
Course in Entomology.....	\$15.00	\$30.00
Course in Geology.....	15.00	30.00
Course in Mechanical Engineering.....	15.00	30.00
Course in Mineralogy.....	15.00	30.00
Course in Physics.....	15.00	30.00
Course in Zoology.....	15.00	30.00
Graduation or Diploma Fee, payable before senior final examinations.....		7.00

Fees for Graduate Students

Tuition, Public Room Service, and Department Privileges.....	\$85.00	\$170.00
Diploma Fee: Master's degree.....		7.00
Doctor's or Engineer's degree.....		25.00

Remission of Fees

To students holding State scholarships under the Act of 1864 (see page 201) the charge for tuition is remitted, but not the charge for public room service or the special fees enumerated in the preceding list.

To students holding State scholarships under the Act of 1890 as amended by the Act of 1905 (see page 201), the charges for tuition and also those for public room service and all special fees are remitted.

BOARD AND ROOMS

During the present year board is furnished at Winants Hall at \$4.50 a week. Accommodations can be found elsewhere at about the same rates, but the Faculty is empowered to pass such regulations relative to the number of boarders in each house as they may think proper, and students are permitted to board only at such places as are approved by the Faculty.

The weekly rental of rooms in Winants Hall is \$1 to \$1.50, in the John Howard Ford Dormitory \$2 to \$2.75, for each occupant. One student occupying a double room or two students occupying rooms intended for three will be charged the full rental for the room or the suite. Detailed schedules of the rates may be obtained from the Registrar.

Rooms are taken for the full year of 40 weeks, and rent is payable in advance, one-half at the beginning of each term. Agreement

to pay rent for the entire suite must be signed by the student who draws it, or his guardian. Rooms may be occupied from the Monday preceding the opening of the college year to the Saturday following commencement.

In drawing for choice of rooms the order of classes will be followed, precedence being given to seniors. The drawing for the year 1917-1918 will take place in the Registrar's office on Tuesday, May 29, 1917, at 4 p. m.

Winants Hall

This building, erected in 1890, accommodates 90 students. It is heated by steam and lighted by gas. Bathrooms, lavatories, and storerooms are on each floor. Ample provision is made of fire escapes and other securities against accidents.

The rooms are arranged in suites of three, a study and two sleeping rooms, for two or three students; there are also a few single rooms. The large study rooms are each furnished with two study tables and two chairs. The bedrooms are each furnished with an oak set, consisting of bedstead (with springs and mattress), bureau, and washstand. Sheets, pillows, pillowcases, coverlets, towels, bowl and pitcher, etc., are to be supplied by the occupant.

John Howard Ford Dormitory

Completed and first occupied in 1915, this dormitory provides accommodation for 80 students. It is a fireproof building, heated by steam and lighted by electricity.

It is divided into five houses with distinct main entrances and connected only through the basement. Bathrooms and lavatories are in the basement and on the top floor of each house.

There are a few single rooms, and many suites of rooms with study and one bedroom or study and two bedrooms and with large closets. Each study is handsomely furnished with table or two tables, bookcase and chairs, and each bedroom is furnished with bed, springs, mattress and pillow, bureau and chair. Students must provide sheets, pillow-cases, coverlets, and towels.

Peter Hertzog Hall

Such rooms in Peter Hertzog Hall as are not required by students in the Theological Seminary may be rented by students of the College.

ESTIMATE OF EXPENSES

	One Year	
Fees, exclusive of admission and graduation fees.....	\$140 to \$170	
Board, 36 weeks at \$4.50 to \$5 a week.....	162 to 180	
Room rent, \$1 to \$2.75 a week (40 weeks).....	40 to 110	
Total.....	\$342 to \$460	
For scholarships remitting tuition deduct.....	100	100
Total.....	\$242 to \$360	
For scholarships remitting all fees deduct further.....	30 to 70	
Total.....	\$212 to \$290	

ADDITIONAL EXPENSES

The preceding estimate does not include books, clothes, laundry, traveling expenses, etc., as these depend upon the individual circumstances. Student members of the Athletic Association pay annual dues of \$10, in two instalments, \$5 at the beginning of each term.

Students in the technical science courses are required to procure sets of drawing instruments costing from \$7 to \$15. They are advised to defer the purchase of these instruments until entering college, as they will then have the advantage of procuring them under the direction of the Professor of Graphics.

Deposits of varying amount, to cover the cost of breakage and materials, are required in certain laboratory courses in science. Unused portions of such fees are returned.

Students pursuing the course in chemistry and the course in electrical engineering are expected to provide themselves, at their own expense, with the necessary sets and pieces of apparatus, which may be obtained from the regular dealers or from the department. Apparatus obtained from the department may be returned at the end of the year, if in good condition, at a discount of about 10 per cent. from the original cost.

Students taking military science are required to purchase a uniform consisting of cap, blouse, and trousers of olive drab cloth, the cost of which is about \$14. The suit is neat and serviceable and, while required to be worn only at drills, may be worn on any occasion.

EXPENSES OF SHORT COURSES IN AGRICULTURE

Tuition in these courses is free to residents of New Jersey; non-residents pay a tuition fee of \$25 on entering. There is also a registration fee of \$5 for all. The principal items of expense are the cost of living in New Brunswick and of travel to and from the city. Comfortable rooms with table board can be obtained within ten to fifteen minutes' walk of the main agricultural building for \$5.50 to \$8.50 a week. Trips of inspection to nearby farms may cost \$5 or \$6 for the term. The cost of books is approximately \$10. The total expense of the course is about \$125. The required entrance fee is to be paid when the application is accepted, or it may be sent with the application, as the numbers must be limited because of lack of room.

EXPENSES OF THE SUMMER SESSION

Residents of New Jersey do not pay tuition. Every student, however, is required to pay a registration fee. Small fees are charged also in connection with certain courses. Students may take home articles made in the various classes by paying the cost of materials used. Residents of other states must pay tuition besides the above fees.

The dormitories, college dining hall, and many private residences are open to the summer students. Single rooms cost \$1.50 to \$3.00 and double rooms \$1 to \$2.75 a week for each occupant. Board is \$4.50 to \$5.50 a week. A special circular giving full information will be sent on request.

AFFILIATED SOCIETIES

Advanced work in various departments of the College is actively sustained through the several societies which meet under the patronage of the professors and instructors together with alumni and other residents of New Brunswick interested in special branches of learning. Such societies, some of them of many years' existence and all of them meeting at least monthly, are the Historical Society, the Scientific Society, the Astronomical Society, the Graduate Students Club, the Phi Beta Kappa Society, the Greek Club, the Alliance française.

STUDENT ORGANIZATIONS

The Young Men's Christian Association holds a weekly prayer and conference meeting, maintains Bible classes, and otherwise promotes active religious work under the general direction of an experienced Executive Secretary.

The Targum Association issues the weekly paper, which is edited and managed by the students and has been successfully maintained since 1869.

A committee of the students cooperating with a committee of the Faculty arranges each year a program of inter-collegiate debates.

The Philoclean Literary Society meets biweekly, with programs of literary criticism, discussion, and debate.

Technical clubs composed of students in the departments of civil engineering, electrical and mechanical engineering, chemistry, biology, and agriculture meet regularly for the presentation and discussion of papers.

A glee club, which has been in continuous existence for more than twenty-five years, a mandolin club, and other musical organizations are maintained by the students.

Nine Greek letter societies (the first established here in 1845) and three students' clubs occupy houses which serve in large measure as dwelling houses for their members.

ATHLETICS

In order to secure for the students the benefits of outdoor exercise athletic sports are encouraged by the provision of adequate facilities. Rightly controlled such sports have shown themselves beneficial both to the health of the students and to the quality of the work done and are manifestly in the interest of good order.

Each student is required before enrolment by the manager of an athletic team or organization or before entering his

name for match contests to obtain from the Professor of Physical Training a certificate, good for the current college year only, stating that the candidate is physically fit for such contests.

Athletic sports are under control of an incorporated Athletic Association governed by a board of nine trustees and supported by the membership dues of the students.

Details in the conduct of athletics are in charge of a Board of Managers which meets once a month during the college year. This board is composed of a representative of the Faculty, three alumni, three undergraduates, together with the President and Treasurer of the Association, the Chairman of the Board of Trustees of the Athletic Association, and *ex officio* the Physical Director of the College. In this way a cordial cooperation has been steadily maintained between Faculty and students, thus minimizing the need for the exercise of direct authority.

CATALOGS

Besides the annual catalog the College has published a general catalog of the trustees, members of the faculty, and students from 1766 to 1916, with historical notes (which may be secured at a cost of \$1.50 a copy bound in paper and \$2 in cloth). A supplementary list giving the latest addresses of living alumni is published annually.

Several smaller pamphlets have been prepared, including a condensed circular of information and special announcements of the short courses in Agriculture, the short course in Ceramics, and the Summer Session.

Any of these publications may be obtained, upon application to the Registrar.

RUTGERS COLLEGE CADET CORPS

1915-1916

Commandant

Captain Shelby C. Leasure, U. S. Infantry

Battalion Staff

Cadet First Lieutenant, E. S. Willever, *Battalion Adjutant*Cadet R. P. White, *Color Sergeant*Cadet M. J. Folensbee, *Color Sergeant*

Band

Instructor L. W. Kimball, *Leader*Cadet T. L. Elmendorf, *Drum Major*Cadet J. B. Moore, *Sergeant*Cadet J. H. Huntington, *Sergeant*Cadet L. D. Thompson, *Sergeant*Cadet L. H. French, *Corporal*Cadet H. W. Faint, *Corporal*Cadet D. V. Della Volpe, *Corporal*Cadet H. M. Sheppard, *Corporal*

Company A

Captain J. B. Scarr

First Lieutenant H. J. Rockafeller

Second Lieutenant F. J. Ulrich

First Sergeant W. D. Reese

Sergeant W. H. Bowles

Sergeant W. K. Wood

Sergeant W. W. Payne

Sergeant H. Sloane

Sergeant E. T. Hurley

Corporal R. Elmer

Corporal F. B. Heitkamp

Corporal A. F. Hope

Corporal R. O. Bowlby

Corporal H. E. Wettyen

Corporal W. P. Thorp

Corporal J. L. Larew

Corporal W. S. Woodward

Company B

Captain C. J. Colville

First Lieutenant J. Monteith

Second Lieutenant L. J. Taylor

First Sergeant S. I. Horn

Sergeant J. F. Miller

Sergeant F. C. Johnson

Sergeant R. L. Scharring-Hausen

Sergeant R. R. Hannas

Corporal H. C. Koehler

Corporal W. L. Kroemmelbein

Corporal F. H. Broome

Corporal M. L. Graff

Corporal R. F. Layton

Corporal H. R. Klein

Corporal A. L. Pfeil

Corporal J. L. Pitt

Company C

Captain D. C. Jenkins
First Lieutenant E. Florance
Second Lieutenant W. S. Sprague
First Sergeant G. R. Hartley
Sergeant A. W. Holzmann
Sergeant D. M. Abt
Sergeant C. H. Luster
Sergeant R. G. Test
Sergeant J. K. Powell

Corporal L. S. Archibald
Corporal H. B. Holcombe
Corporal D. E. Davis
Corporal F. E. Mehrhof
Corporal C. F. Simpson
Corporal A. L. Grimme
Corporal H. C. Smalley
Corporal F. S. Beckwith
Corporal P. R. Smith
Corporal N. F. Dahl

Company D

Captain W. P. Ainsworth
First Lieutenant L. W. Sharp
Second Lieutenant R. B. Hiller
First Sergeant C. H. Reed
Sergeant F. J. Scarr
Sergeant H. W. Boes
Sergeant W. P. Duruz
Sergeant A. B. Miller
Sergeant I. R. Troll

Corporal L. F. Braine
Corporal M. A. Canfield
Corporal M. J. Truscott
Corporal S. J. Herben
Corporal C. L. Walker
Corporal A. F. Conger
Corporal W. N. Packard
Corporal B. P. Croker
Corporal I. D. Buttler
Corporal J. N. Wittpenn

DEGREES CONFERRED JUNE 13, 1916

* HONORARY DEGREES

Doctor of Laws

GRAHAM TAYLOR

Chicago, Ill.

Doctor of Divinity

CORNELIUS BRETT

Jersey City

Master of Arts

EDWIN BELL DAVIS

New Brunswick

CHARLES LANG FREER

Detroit, Mich.

JOSEPH SHERMAN FRELINGHUYSEN

Raritan

Master of Science

JOSEPH COMPTON CASTNER

Washington, D. C.

Civil Engineer

LOUIS DAVID BLAUVELT

Denver, Col.

GRADUATE DEGREES

Bachelor of Divinity

JAMES CLAUDE THOMSON

B.Sc., Rutgers College, 1910

M.Sc., Rutgers College, 1911

M.A., Columbia University, 1916

Master of Arts

HAROLD CURTICE AMOS

A.B., Rutgers College, 1912

SEYMOUR PARKER GILBERT, JR.

A.B., Rutgers College, 1912

WILLIAM GETTIER HERRMAN

A.B., Rutgers College, 1912

VIVIAN CLINTON ROSS

A.B., Rutgers College, 1912

Master of Science

- DAVID AUGUSTUS COLEMAN
B.Sc., Massachusetts Agricultural College, 1914
- CARL RAYMOND FELLERS
A.B., Cornell University, 1915
- JOHN QUIETTON FREY
B.Sc., Rutgers College, 1901
- NICHOLAS KOPELOFF
B.S., Columbia University, 1912
B.Sc., Cornell University, 1914
- HARRY C. MCLEAN
B.Sc., Kansas Agricultural College, 1908
- ARTHUR COSTELLO METCALF
B.Sc., Rutgers College, 1914
- EDWARD ROBERT SCHMID
B.Sc., Rutgers College, 1914
- SELMAN ABRAHAM WAKSMAN
B.Sc., Rutgers College, 1915

Civil Engineer

- | | |
|------------------------------|------------------------------|
| OLIVER FRITTS MITCHELL | ARTHUR BOYLE MURPHY |
| B.Sc., Rutgers College, 1913 | B.Sc., Rutgers College, 1910 |

Mechanical Engineer

- | | |
|------------------------------|------------------------------|
| HENRY ANTHONY COZZENS, JR. | JOHN PRESTON MAILLER |
| B.Sc., Rutgers College, 1913 | B.Sc., Rutgers College, 1912 |
| FREDERIC GLANDER | JAMES WALTER MAILLER |
| B.Sc., Rutgers College, 1912 | B.Sc., Rutgers College, 1912 |

Ceramic Engineer

- HOWARD WESTON BLOOMFIELD
B.Sc., College of the City of New York, 1901
- HERMAN ARTHUR PLUSCH
B.Sc., Rutgers College, 1904

Doctor of Philosophy

- HENRY CLAY LINT
B.Sc., Kansas Agricultural College, 1912

DEGREES CONFERRED IN COURSE

Bachelor of Arts

DUDLEY BARNITZ BROWNING	WALLACE WARREN KLOEFFEL
DAVID NIELSON BULLOCH	(post obitum)
SHERMAN LINDSLEY CONKLIN	ARTHUR ROBERT LEWIS
CLARKSON ATWOOD CRANMER	ADRIAN COLEY MINTON
ROSS HARRISON FLANAGIN	ANTON ADOLPH RAVEN, JR.
DONALD DUNSTAN HAND	RAYMOND BOVEY SEARLE
WILLIAM THOMAS HUTCHINSON	RALPH WHITAKER VOORHEES
EDWARD STEBBINS INGHAM	HUGO OTTO WENDEL
GEORGE HENRY WHISLER	

Bachelor of Letters

GLENN EDWARD CHARLES	CLIFFORD FREDERICK POST
LOUIS BENOID GITTELMAN	CHARLES HAROLD REED
EDWIN LAMB LOSEE	JAMES BERNARD SCARR
CLIFFORD ANTHONY McLAUGHLIN	WILLIAM SMITH SPRAGUE
HARVEY THEODORE MANN	WILLIAM CHESTER WELLS, JR.
EDWARD LOUIS PEPPER	RALPH POLLOCK WHITE

Bachelor of Science

WILLIAM PENN ESTERBROOK	EDGAR THOMAS HURLEY
AINSWORTH	DEAN CARTER JENKINS
RAYMOND MUNKITTRICK AUSTIN	FRANK CHAMBLISS JOHNSON
MURRAY APPLEBY CHITTICK	HARRIS TORBERT KILLE
JAMES MELVILLE COLEMAN	WILLIAM H. WOOD KOMP
CLIFFORD JAMES COLVILLE	LINWOOD LAWRENCE LEE
TRACY LAKE ELMENDORF	LOUIS WRIGHT MARTIN
ADRAIN FISHER	JULIAN FRANCIS MILLER
EDWIN FLORANCE	EDWARD LESLIE MOLINEUX
HERBERT FRANCIS HALEY	JOHN MONTEITH, JR.
RALSTON RAYMOND HANNAS	JARED BLANCHARD MOORE
GEORGE RUSSELL HARTLEY	CLARENCE ALBERT MOREY
GEORGE FOSTER HERBEN	ROBERT ARTHUR NASH
RICHARD BEVIER HILLER	WILLIAM WARREN PAYNE
STANLEY IRVING HORN	JOSEPH RATNER
CHARLES HRUBY	WALTER DILTS REESE
JONATHAN HENRY HUNTING-	HARRY JOSEPH ROCKAFELLER, JR.
TON, 3D	GEORGE BANCROFT ROESCH

LEO ROGIN	LEWIS JEROME TAYLOR
THEODORE ROSEN	BENJAMIN EDMUND THOMAS
ROBERT LOUIS SCHARRING- HAUSEN	JOHN PETER TOOHEY, JR. (post obitum)
DAVID SCHMIDT	WAINWRIGHT DARROW TWING
HERBERT CRITTENDEN SEGUR	FREDERICK JOHN ULRICH
RALPH GEORGE SEILER	HAROLD WESLEY VAN LIEW
LAURENCE WILLIS SHARP	EARL STROUSE WILLEVER
HARRY SLOANE	WALTER KLEMMER WOOD
JOSEPH SAMUEL ZASS	

HONORS CONFERRED JUNE 13, 1916

GRADUATION HONORS

High Honors

CLARKSON ATWOOD CRANMER	EDWARD STEBBINS INGHAM
EDWIN FLORANCE	DEAN CARTER JENKINS
JONATHAN HENRY HUNTING- TON, 3D	WILLIAM WARREN PAYNE
WILLIAM THOMAS HUTCHINSON	EDWARD LOUIS PEPPEL
	WALTER KLEMMER WOOD

Honors

WILLIAM PENN ESTERBROOK AINSWORTH	ADRIAN COLEY MINTON
CLIFFORD JAMES COLVILLE	JOHN MONTEITH, JR.
ROSS HARRISON FLANAGIN	JOSEPH RATNER
LOUIS BENOID GITTELMAN	GEORGE BANCROFT ROESCH
RALSTON RAYMOND HANNAS	LEO ROGIN
GEORGE RUSSELL HARTLEY	THEODORE ROSEN
EDGAR THOMAS HURLEY	DAVID SCHMIDT
FRANK CHAMBLISS JOHNSON	LAURENCE WILLIS SHARP
HARRIS TORBERT KILLE	LEWIS JEROME TAYLOR
ARTHUR ROBERT LEWIS	BENJAMIN EDMUND THOMAS
HARVEY THEODORE MANN	FREDERICK JOHN ULRICH
	RALPH WHITAKER VOORHEES
RALPH POLLOCK WHITE	

Special Honors

In Agriculture.....	HARRIS TORBERT KILLE
In Chemistry.....	CLIFFORD JAMES COLVILLE
In Civil Engineering.....	DEAN CARTER JENKINS
In Civil Engineering.....	WALTER KLEMMER WOOD
In Education.....	EDWARD LOUIS PEPPEL
In Electrical Engineering...	WILLIAM WARREN PAYNE
In Electrical Engineering...	FREDERICK JOHN ULRICH
In English.....	WILLIAM THOMAS HUTCHINSON

In French.....	EDWARD STEBBINS INGHAM
In German.....	WILLIAM THOMAS HUTCHINSON
In Mathematics.....	EDWARD STEBBINS INGHAM
In Mechanical Engineering..	WILLIAM PENN ESTERBROOK AINSWORTH
In Philosophy.....	EDWARD LOUIS PEPPLE

Commencement Speakers

CLARKSON ATWOOD CRANMER
RALPH POLLOCK WHITE

Honors in Military Department

The "Best Soldier," whose name is engraved on a bronze tablet in the Ballantine Gymnasium:

Cadet Captain CLIFFORD JAMES COLVILLE

The following cadets were reported to the Adjutant General, United States Army, and to the Adjutant Generals of their respective States as having shown special aptitude for Military Service:

Cadet Captain CLIFFORD JAMES COLVILLE
Cadet Captain JAMES BERNARD SCARR
Cadet Captain WILLIAM PENN ESTERBROOK AINSWORTH
Cadet Captain DEAN CARTER JENKINS
Cadet First Lieutenant HARRY JOSEPH ROCKAFELLER, JR.
Cadet First Lieutenant EARL STROUSE WILLEVER
Cadet First Lieutenant JOHN MONTEITH, JR.
Cadet First Lieutenant LAURENCE WILLIS SHARP
Cadet First Lieutenant EDWIN FLORANCE
Cadet Second Lieutenant WILLIAM SMITH SPRAGUE
Cadet Second Lieutenant RICHARD BEVIER HILLER
Cadet Second Lieutenant FREDERICK JOHN ULRICH
Cadet Second Lieutenant LEWIS JEROME TAYLOR
Cadet First Sergeant CHARLES HAROLD REED
Cadet First Sergeant GEORGE RUSSELL HARTLEY
Cadet First Sergeant WALTER DILTS REESE
Cadet First Sergeant STANLEY IRVING HORN

Phi Beta Kappa**Class of 1916**

CLIFFORD JAMES COLVILLE	EDWARD STEBBINS INGHAM
EDWIN FLORANCE	DEAN CARTER JENKINS
LOUIS BENOID GITTLEMAN	HARRIS TORBERT KILLE
JONATHAN HENRY HUNTING-	HARVEY THEODORE MANN
TON, 3D	EDWARD LOUIS PEPPEL
WILLIAM THOMAS HUTCHINSON	WALTER KLEMMER WOOD

UNDERGRADUATE HONORS**Junior Orators****Class of 1917**

CHARLES EDWARD BLOODGOOD	FREDERICK BENJAMIN HEITKAMP
HERMAN EISENBERG	HARRY LATIMER JANEWAY
LAWRENCE HENRY FRENCH	FRANCIS JOSEPH SCARR
ISIDOR BIP GLUCKSMAN	LANSING PETER SHIELD

Sophomore Orators**Class of 1918**

DANIEL HUDSON BOWMAN	JOSEPH HOFFMAN EDGAR
CHESTER EARL BREECE	NOEL DUNHAM LUDLOW
ANSON MAPES DU BOIS	WALTER RICHARD NETZEL
JAMES HALL PITMAN	

Honor Men**Class of 1918**

A = A.B. course.	G = General B.Sc. course
L = Litt.B. course	S = Technical B.Sc. course
Daniel Hudson Bowman	G Dickinson High School
Philip Marcus Brenner	G Battin High School
Marcus Aurelius Canfield, Jr.	S Barringer High School
Norman Fredrik Dahl	S Bloomfield High School
Searle Benwell Dougherty	S Battin High School
William Scudder Higbie	S Cranford High School
Jacob Joffe	S East Side High School (Newark)
Noel Dunham Ludlow	G Brooklyn Boys' High School
Royal Franklin Nichols	A Barringer High School
George Bodo Otto	S Bound Brook High School
James Hall Pitman	A Barringer High School

Howard Monroe Sheppard	S	Bridgeton High School
Harry Clark Smalley	G	Newton High School
Millwood Joseph Truscott	S	Camden High School
Clifford De Puyster Wilkin	A	Wallkill High School

Class of 1919

Harrison Kingsland Ackerman, Jr.	L	Paterson High School
John Willson Armstrong, Jr.	A	Blair Academy
Joseph Breckley	S	Ocean City High School
Frederick William Bullwinkel	L	Hackensack High School
Anthony Edward Casale	A	Barringer High School
Cono Cornelius Casale	A	Barringer High School
Albert Daniel Cheston	S	Clifton High School
Joseph Louis Costa	S	Dickinson High School
Donald Hills Davenport	S	Roselle High School
Churchill Charles Franklin	L	Jamesburg High School
Earl Stretch Harris	S	Salem High School
George Adrian Kuyper	A	Paterson High School
Carl Henry Maar	A	Albany Academy
Titus Bonner Maxwell	S	Brooklyn Boys' High School
Ross Heylmunn Miner	A	Erasmus Hall High School
Perry Martin Moore	S	Bloomfield High School
George Hargis Prall	S	Woodbridge High School
Austin Melville Rice	S	Bloomfield High School
Paul Le Roy Robeson	A	Somerville High School
Mefford Ross Runyon	S	New Brunswick High School
William Seltzer	S	Vineland High School
John Frederick William Stephan	G	Ethical Culture High School
Pierre Van Dyck	A	Rutgers Preparatory School
Benjamin Booth Wainwright	A	Drury High School (North Adams, Mass.)
Sheldon Elliott Ward	G	Madison High School
Edward David Warenreich	S	Barringer High School
Walter Cobson Weller	S	Bayonne High School

PRIZES AWARDED, 1915-1916

SENIOR PRIZES

Joseph P. Bradley Prize in Mathematics	EDWARD STEBBINS INGHAM
Elizabeth Appleton Memorial Prize in Moral Science	HARVEY THEODORE MANN
Ann Van Nest Bussing Prizes in Extempore Speaking	First GEORGE HENRY WHISLER
	Second RAYMOND BOVEY SEARLE
Monsignor O'Grady Prizes in Extempore Speaking	First GEORGE HENRY WHISLER
	Second RAYMOND BOVEY SEARLE
Jacob Cooper Prize in Logic	HARVEY THEODORE MANN
Theodore Frelinghuysen Vail Prize for Scholarship	HARVEY THEODORE MANN
John Bernhard Smith Memorial Prize in Electrical Engineering	EDGAR THOMAS HURLEY

SENIOR AND JUNIOR PRIZES

John Parker Winner Memorial Prize in Mental Science	RALPH POLLOCK WHITE
Joseph P. Bradley Prize in Roman Law	BENJAMIN SHANEFIELD
Luther Laffin Memorial Prizes in Mental Science	First EDWARD LOUIS PEPPEL
	Second ISIDOR BIP GLUCKSMAN

JUNIOR PRIZES

Irving S. Upson Prizes in Oratory	First HARRY LATIMER JANEWAY
	Second ISIDOR BIP GLUCKSMAN

SOPHOMORE PRIZES

Myron W. Smith Memorial Prizes in Oratory

First NOEL DUNHAM LUDLOW

Second DANIEL HUDSON BOWMAN

Peter Spader Prizes in Modern History

First ROYAL FRANKLIN NICHOLS

Second JOSEPH HOFFMAN EDGAR

FRESHMAN PRIZES

Tunis Quick Prize in English Grammar and Spelling

CARL HENRY MAAR

Edward Livingston Barbour Prizes in Declamation

First PAUL LE ROY ROBESON

Second ELMER HORTON FRENCH

GENERAL PRIZES

Samuel and Louisa Van Vechten Prize for Essay on Missions

GEORGE HENRY WHISLER

William H. Van Doren Prize for Essay on Missions

HAROLD WILLIAM SCHENCK

Chicago Alumni Club Prize in Literature and Library Use

NOEL DUNHAM LUDLOW

Alliance française Prize in French

WILLIAM CHESTER WELLS, JR.

John P. Wall Targum Prizes

First SHERMAN LINDSLEY CONKLIN

Second LOUIS GINSBERG

REGISTER OF STUDENTS

GRADUATE STUDENTS

- Allison, Franklin Elmer *Oakland City, Ind.* 65 Paterson St.
 B.S.A., Purdue University, 1914
 M.S., Iowa State College, 1915
 Amo-Phos Research Fellow
- Baldwin, Raymond Leslie *Clinton* 35 Oliver St.
 B.Sc., Rutgers College, 1909
 Soil Fertility, Farm Management
- Coleman, David Augustus *Framingham, Mass.* 16 Codwise Ave.
 B.Sc., Massachusetts Agricultural College, 1914
 M.Sc., Rutgers College, 1916
 Sodium Nitrate Research Fellow
- Curtis, Roland Edward *New Brunswick* College Farm
 B.S.A., Oregon Agricultural College, 1915
 Research Assistant in Soil Bacteriology
- Day, James Westbay *Monett, Mo.* 2 High St.
 B.S.A., University of Missouri, 1914
 A.M., University of Missouri, 1916
 Research Assistant in Crops
- Fellers, Carl Raymond *Colosse, N. Y.* 65 Paterson St.
 A.B., Cornell University, 1915
 M.Sc., Rutgers College, 1916
 Soy Bean Research Fellow
- Haenseler, Conrad Martin *Chattanooga, Tenn.* 42 Delevan St.
 B.S.A., University of Tennessee, 1914
 M.S.A., University of Tennessee, 1916
 Zinc Oxide Research Fellow
- Haley, Herbert Francis *Elizabeth* Elizabeth
 B.Sc., Rutgers College, 1916
 Vander Poel Fellow in Chemistry

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- | | | |
|---|-------------------------|----------------------|
| Koch, George Peter | <i>Elma, Wash.</i> | 95 Bayard St. |
| B.S., Washington State College, 1913 | | |
| M.S., University of Minnesota, 1914 | | |
| Potash Research Fellow | | |
| Kopeloff, Nicholas | <i>New York, N. Y.</i> | 16 Codwise Ave. |
| B.Sc., Columbia University, 1912 | | |
| B.Sc., in Agr., Cornell University, 1914 | | |
| M.Sc., Rutgers College, 1916 | | |
| Pulverized Limestone Research Fellow | | |
| Krout, Webster Sherburn | <i>Bremen, Ohio</i> | 65 Paterson St. |
| B.Sc., Ohio State University, 1915 | | |
| M.A., Ohio State University, 1915 | | |
| Research Assistant in Plant Pathology | | |
| McLean, Harry C. | <i>New Brunswick</i> | 39 Delevan St. |
| B.Sc., Kansas Agricultural College, 1908 | | |
| M.Sc., Rutgers College, 1916 | | |
| Soil Fertility, Soil Bacteriology, Agricultural Chemistry | | |
| Martin, William Hope | <i>Carlisle, Pa.</i> | Alumni House |
| B.A., University of Maine, 1915 | | |
| Research Assistant in Plant Pathology | | |
| Minton, Adrian Coley | <i>Red Bank</i> | 38 College Ave. |
| A.B., Rutgers College, 1916 | | |
| Herbert Memorial Fellow in Political Science | | |
| Monteith, John, Jr. | <i>Chatham</i> | 67 Remsen Ave. |
| B.Sc., Rutgers College, 1916 | | |
| Plant Pathology, Plant Breeding, Entomology | | |
| Moore, Mrs. Mary Mitchell | <i>New Brunswick</i> | 110 North Sixth Ave. |
| A.B., Bryn Mawr College, 1915 | | |
| Physiology, Biochemistry, Organic Chemistry | | |
| Neller, Joseph R. | <i>New Brunswick</i> | 42 Delevan St. |
| B.S., Macalester College, 1913 | | |
| M.Sc., University of Minnesota, 1916 | | |
| Research Assistant in Soil Bacteriology | | |
| Piper, John Vincent | <i>Springfield, Vt.</i> | 262 Comstock St. |
| B.S.A., University of Vermont, 1916 | | |
| Research Assistant in Botany | | |

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- Schlatter, Fidel Paul *Tunkhannock, Pa.* 86 Commercial Ave.
B.Sc., Pennsylvania State College, 1915
Research Assistant in Cranberry Investigation
- Schmidt, David *Yorktown, Va.* 531 Ford Hall
B.Sc., Rutgers College, 1916
Pomology, Market Gardening
- Schultz, Orville Carl *Postville, Iowa* 26 Handy St.
B.Sc., Iowa State College, 1915
Research Assistant in Botany
- Schwarze, Carl Alois *New Brunswick* 22 Kirkpatrick St.
B.S., University of Missouri, 1909
Plant Pathology, Plant Physiology, Biological Chemistry
- Thomas, Benjamin Edmund *Bound Brook* 502 George St.
B.Sc., Rutgers College, 1916
Vander Poel Fellow in Chemistry
- Waller, Allen George *Freehold* Alumni House
B.Sc., Rutgers College, 1915
Farm Management, Agronomy
- Waszko, Jan *Warsaw, Poland* 110 North Sixth Ave.
University of Cracow, 1914
Physiology, Quantitative Analysis, Biochemistry
- Wolkoff, Michael Ivanovitch *Karpovo, Russia* 105 Seaman St.
B.S., Michigan Agricultural College, 1915
M.S., Michigan Agricultural College, 1916
Ammonium Sulphate Research Fellow
- Woodward, Carl Raymond *New Brunswick* 253 Lawrence Ave.
B.Sc., Rutgers College, 1914
Agriculture, Educational Administration, Secondary Education

SENIOR CLASS

Class of 1917

A = A.B. course
L = Litt.B. course

G = General B.Sc. course
S = Technical B.Sc. course

† = Pursuing in part junior work

Abt, David Milton Paul	G	<i>Hasbrouck Heights</i>	Bleecker Place
Ackerman, David Greenlie	A	<i>Passaic</i>	74 College Ave.
Archibald, Lauren Sinclair†	S	<i>Bovina, N. Y.</i>	41 College Ave.
Benjamin, Charles Egbert	G	<i>Port Richmond, N. Y.</i>	172 College Ave.
Bloodgood, Charles Edward	A	<i>Catskill, N. Y.</i>	14 Hertzog Hall
Bloom, Winfred Colby	G	<i>Catskill, N. Y.</i>	542 George St.
Boes, Herbert Waldemar	S	<i>Newark</i>	542 George St.
Bowen, Paul Mitchell	S	<i>Shiloh</i>	78 College Ave.
Bowlby, Robert Oswald†	S	<i>Somerville</i>	74 College Ave.
Braine, Lawrence Fulton, Jr.	G	<i>New York, N. Y.</i>	74 College Ave.
Breitkopf, Morris	S	<i>New Brunswick</i>	35 Albany St.
Broome, Frank Haviland	S	<i>Roselle Park</i>	Roselle Park
Chambers, Joseph Leslie†	S	<i>Yonkers, N. Y.</i>	17 Mine St.
Cooley, Louis Appgar	S	<i>Trenton</i>	18 College Ave.
Cunnius, Percy Eugene	A	<i>New Brunswick</i>	302 Raritan Ave.
Drill, Max	S	<i>Newark</i>	116 Winants Hall
Duruz, Willis Pierre	S	<i>Baldwin, N. Y.</i>	41 College Ave.
Eisenberg, Herman	S	<i>Norma</i>	117 Winants Hall
Elmer, Rudolph†	S	<i>Egg Harbor City</i>	74 College Ave.
Faint, Harold Willis	S	<i>Roselle Park</i>	502 George St.
Fawcett, Harold Irving	L	<i>Ridgewood</i>	114 College Ave.
French, Lawrence Henry	G	<i>Plainfield</i>	41 College Ave.
Gaskill, Earl Courtney	S	<i>Barnegat</i>	25 Easton Ave.
Glucksman, Isidor Bip	G	<i>Newark</i>	143 Winants Hall
Graff, Manton Lewis	S	<i>Jersey City</i>	525 Ford Hall
Hageman, Benjamin Bernardus	S	<i>Millstone</i>	502 George St.
Hamm, Herbert DeFreest	A	<i>Troy, N. Y.</i>	502 George St.
Heitkamp, Frederick Benjamin	G	<i>Chatham</i>	74 College Ave.
Herbert, Wilbur Copley†	G	<i>Newfoundland</i>	18 College Ave.
Hewel, Alfred Gustav	S	<i>Jersey City</i>	67 Stone St.
Hickman, Alfred Mervin†	G	<i>Asbury Park</i>	18 College Ave.
Holcombe, Harry Britton	S	<i>Lambertville</i>	College Farm
Holzmann, Albert William	G	<i>Newark</i>	502 George St.
Hope, Arthur Fred	S	<i>Asbury Park</i>	17 Mine St.

Janeway, Harry Latimer	L	<i>New Brunswick</i>	17 Livingston Ave.
Johnson, John William	L	<i>Stanton</i>	95 College Ave.
Kahn, Jerome	S	<i>New Brunswick</i>	24 Schuyler St.
Klein, Harry Rampey	S	<i>Irvington</i>	441 Ford Hall
Koehler, Herbert Clarence	S	<i>Hazleton, Pa.</i>	41 College Ave.
Kroemmelbein, Walter Fred	S	<i>Elizabeth</i>	502 George St.
Larew, Joel Lee	S	<i>South Amboy</i>	South Amboy
Layton, Roy Francis	G	<i>New York, N. Y.</i>	74 College Ave.
Leeds, Marvin	G	<i>Atlantic City</i>	74 College Ave.
Levy, Max	S	<i>Newark</i>	44 College Ave.
Luster, Clifton Henry	S	<i>Elizabeth</i>	95 College Ave.
McDonald, Charles Francis, Jr.	G	<i>Englishtown</i>	Englishtown
Maddock, John Broomfield†	S	<i>Trenton</i>	38 College Ave.
Martin, Robert Van Emburg†	G	<i>Hasbrouck Heights</i>	26 Union St.
Mehrhof, Floyd Edward	S	<i>Ridgefield Park</i>	41 College Ave.
Miller, Alan Bertram	S	<i>Merchantville</i>	Bleecker Place
Osborne, Clifford Pierson	A	<i>Mt. Freedom</i>	341 Ford Hall
Patz, Gustav	A	<i>Newark</i>	140 Winants Hall
Perpente, George John Augustus	G	<i>Middlebush</i>	502 George St.
Pfeil, Alfred Leslie	S	<i>Irvington</i>	236 Ford Hall
Pitt, John Lawrence	A	<i>Bridgeton</i>	260 Townsend St.
Powell, John Kingsley	S	<i>Metuchen</i>	18 College Ave.
Ruh, Karl Henry, Jr.	S	<i>Millstone</i>	Millstone
Scarr, Francis Joseph	S	<i>Hasbrouck Heights</i>	Bleecker Place
Seidler, Sydney	A	<i>Newark</i>	44 College Ave.
Seidman, Edwin Arthur	S	<i>Newark</i>	224 Ford Hall
Seidman, Herbert Walter	S	<i>Newark</i>	224 Ford Hall
Seward, Walter Hamilton	A	<i>Vineland</i>	66 Winants Hall
Shanefield, Benjamin	L	<i>Vineland</i>	311 Ford Hall
Shield, Lansing Peter	A	<i>New Brunswick</i>	23 S. Second Ave.
Spitzer, Harry	L	<i>Perth Amboy</i>	Perth Amboy
Stevens, John Bayard	S	<i>New Brighton, N. Y.</i>	18 College Ave.
Summerill, Frederick	S	<i>Penns Grove</i>	542 George St.
Test, Robert Gerald	S	<i>Merchantville</i>	Bleecker Place
Thompson, Lawrence Dorland	S	<i>Rutherford</i>	41 College Ave.
Thomson, James Wallace	S	<i>New Kingston, N. Y.</i>	41 College Ave.
Thorp, William Phillips, Jr.	S	<i>East Orange</i>	77 Hamilton St.
Trimnell, Louis, Jr.†	S	<i>Newfield</i>	502 George St.
Troll, Irving Russell	S	<i>Jersey City</i>	38 College Ave.

Wettyen, Harold Ehler	S	<i>Cedar Grove</i>	542 George St.
Whynman, William	S	<i>Elizabeth</i>	44 College Ave.
Woodward, William Stanley	S	<i>Englishtown</i>	542 George St.

JUNIOR CLASS

Class of 1918

A = A.B. course

L = Litt.B. course

G = General B.Sc. course

S = Technical B.Sc. course

† = Pursuing in part sophomore work

Angus, Willis Wolcott	S	<i>Montclair</i>	17 Mine St.
Applegate, Melbourne Sawford†	A	<i>East Orange</i>	421 Ford Hall
Beckwith, Frank Samuel†	S	<i>Olean, N. Y.</i>	41 College Ave.
Beisler, Walter Herman	S	<i>Hilton</i>	109 Winants Hall
Berg, Henry Caspar	A	<i>Yonkers, N. Y.</i>	77 Hamilton St.
Beyer, Eugene Edward	S	<i>Atlantic City</i>	78 College Ave.
Bowman, Daniel Hudson	G	<i>Jersey City</i>	434 Ford Hall
Bracher, Elmer Gladstone†	G	<i>Rahway</i>	77 Hamilton St.
Breece, Chester Earl	G	<i>Cranford</i>	17 Mine St.
Brenner, Philip Marcus	G	<i>Elizabeth</i>	Elizabeth
Buchanan, William Franklin	S	<i>Perth Amboy</i>	Perth Amboy
Buttler, Irving Ditmars	S	<i>New Brunswick</i>	256 Handy St.
Campbell, Melvin	S	<i>Tuckahoe</i>	38 College Ave.
Canfield, Marcus Aurelius, Jr.	S	<i>Newark</i>	424 Ford Hall
Cherry, William Michael†	S	<i>Newark</i>	44 College Ave.
Childs, Walter Leland†	G	<i>Hackensack</i>	114 College Ave.
Clark, Robert Irving	S	<i>Montclair</i>	78 College Ave.
Clayton, Frank LaFetra	S	<i>Freehold</i>	110 Winants Hall
Conahey, Lucius Yates	G	<i>Port Norris</i>	264 Townsend St.
Conger, Allen Ford	G	<i>Trenton</i>	18 College Ave.
Croker, Byron Pennington†	S	<i>Wildwood</i>	Bleecker Place
Dahl, Norman Fredrik	S	<i>Bloomfield</i>	542 George St.
Davis, Donald Edwin	S	<i>New Brunswick</i>	145 College Ave.
DeLamater, John Sherman†	L	<i>Hudson, N. Y.</i>	77 Hamilton St.
Della Volpe, Domenic Vincent			
Andrew	S	<i>Jersey City</i>	502 George St.
Dougherty, Searle Benwell	S	<i>Elizabeth</i>	41 College Ave.
Drake, Arthur Dorward	S	<i>Metuchen</i>	78 College Ave.
Du Bois, Anson Mapes	L	<i>Newburgh, N. Y.</i>	16 Hertzog Hall
Durand, James Blanchard†	S	<i>Rahway</i>	77 Hamilton St.
Edgar, Joseph Hoffman	A	<i>New Brunswick</i>	202 Grant Ave.

Emery, Irving Benjamin	S	Newark	38 College Ave.
Eypper, Norman Kohler†	G	Montclair	114 College Ave.
Ferguson, Alexander Ernest†	S	Springfield	18 College Ave.
Fink, Arthur Louis	G	Ridgefield Park	541 Ford Hall
Gildersleeve, Charles Russell	A	New Brunswick	228 Lawrence Ave.
Ginsberg, Louis†	A	Newark	130 Winants Hall
Golodner, Irving†	S	Newark	130 Winants Hall
Grimme, August Louis†	G	Irvington	74 College Ave.
Hann, William Hamilton†	S	Raven Rock	142 Ford Hall
Haupt, Joseph Jacob, Jr.	S	Montclair	78 College Ave.
Hawkins, Harold James	S	Warwick, N. Y.	78 College Ave.
Herben, Stephen Joseph, Jr.†	G	Westfield	77 Hamilton St.
Higbie, William Scudder	S	Cranford	Cranford
Hill, Harold Ben	L	Columbia	30 Winants Hall
Holman, Wilgus Alexander	A	Newark	424 Ford Hall
Ingling, George Warren†	G	New Brunswick	157 Bayard St.
Jackson, Fred Walter†	S	Summit	542 George St.
Joffe, Jacob	S	Newark	417 Magnolia Ave.
Jones, Ralph Stuart	L	Orange	114 College Ave.
Ludlow, Noel Dunham	G	Brooklyn, N. Y.	41 College Ave.
Lyons, John Dennis†	A	Gardiner, N. Y.	41 College Ave.
MacDonald, George Alexander	S	New Brunswick	203 First Ave.
McKenzie, Robert Abbe	S	Metuchen	77 Hamilton St.
MacLeod, Allister Palmer†	S	Kearny	Kearny
Mason, Howard Fitz Randolph	G	Bound Brook	114 College Ave.
Meuser, Ludwig	S	Bound Brook	Bound Brook
Meyerend, Frank Manley	S	New Brunswick	75 Louis St.
Miller, Harold August	S	Brooklyn, N. Y.	17 Mine St.
Netzel, Walter Richard	L	New Brunswick	307 Redmond St.
Nichols, Royal Franklin	A	New Brunswick	32 Hardenbergh St.
Otto, George Bodo	S	Bound Brook	38 College Ave.
Packard, William Nelson†	G	Upper Montclair	18 College Ave.
Packer, Elmer Willard†	S	Cranford	38 College Ave.
Patz, William	A	Newark	140 Winants Hall
Pelton, Graham	S	Essex, Conn.	90 Winants Hall
Perry, George Herbert†	S	Ocean Grove	17 Mine St.
Pfeil, Carl William, Jr.	S	Irvington	236 Ford Hall
Pitman, James Hall	A	Newark	32 Hardenbergh St.
Rastall, John Wesley†	S	New Brunswick	13 Senior St.
Riker, John Romine, Jr.	S	Trenton	78 College Ave.

Roberts, Joseph Middleton, Jr.	S	Riverton	College Farm
Roy, Andrew William†	S	Augusta	18 College Ave.
Schoonmaker, Ellis Harold	G	Hasbrouck Heights	Bleecker Place
Sheppard, Howard Monroe	S	Cedarville	61 Winants Hall
Smalley, Harry Clark	G	Monroe	62 Winants Hall
Smith, Preston Roberts	S	Bayonne	502 George St.
Smith, Samuel Wilson, Jr.†	S	Kearny	502 George St.
Summerill, Garnett†	S	South Penns Grove	38 College Ave.
Thompson, Franklin Slater†	S	Freehold	110 Winants Hall
Thomson, John Harold†	A	Middlebush	Middlebush
Truscott, Millwood Joseph	S	Camden	Bleecker Place
Van Wagenen, Reller Davis†	A	Walkkill, N. Y.	12 Hertzog Hall
Voorhees, Robert Leland†	L	New Brunswick	River Road
Walker, Charles Liebermann	S	Beach Haven	Bleecker Place
Waterfield, John Roland	G	Irvington	74 College Ave.
Werkheiser, Myron Hale†	S	Philadelphia, Pa.	17 Mine St.
Wilkin, Clifford De Puyster	A	Walkkill, N. Y.	29 Hertzog Hall
Winchell, Clarence William†	S	Jersey City	502 George St.
Wirth, Arthur Jacob	A	East Greenbush, N. Y.	20 Hertzog Hall
Wittpenn, John Nicholas, Jr.	G	Newark	74 College Ave.

SOPHOMORE CLASS

Class of 1919

A = A.B. course

G = General B.Sc. course

L = Litt.B. course

S = Technical B.Sc. course

† = Pursuing in part freshman work

Allan, Robert Williamson†	S	Kearny	90 Winants Hall
Anderson, Roy Elmer	A	Woodbridge	74 College Ave.
Armstrong, John Willson, Jr.	A	Blairstown	442 Ford Hall
Babbitt, Dwight Millen	S	Mendham	542 George St.
Baird, Karl Oliver†	S	Freehold	334 Ford Hall
Balikjian, Daniel†	S	Tennent	191 Albany St.
Barbehenn, Harry Everard	S	Jersey City	87 Winants Hall
Becker, Norman Glebe	S	Newark	542 George St.
Bellerjeau, Charles Henry			
Young	S	Trenton	78 College Ave.
Billings, Horace Patterson	S	Camden	58 Winants Hall
Blackman, William Goynes	S	Trenton	502 George St.
Bleecker, Everett Barkeley	S	Maplewood	78 College Ave.

Bloom, Harry	S	<i>Hackensack</i>	331 Ford Hall
Breckley, Joseph	S	<i>Bloomfield</i>	12 Winants Hall
Briegs, Harold Raymond	G	<i>Perth Amboy</i>	17 Mine St.
Briwa, Charles	S	<i>Hudson, N. Y.</i>	17 Mine St.
Bullwinkel, Frederick William	L	<i>Hackensack</i>	245 Ford Hall
Burr, Samuel Engle, Jr.	G	<i>Bordentown</i>	121 Ford Hall
Bursch, Robert Hardy†	G	<i>Brooklyn N. Y.</i>	95 College Ave.
Casale, Anthony Edward	A	<i>Newark</i>	114 Ford Hall
Casale, Cono Cornelius	A	<i>Newark</i>	114 Ford Hall
Cheston, Albert Daniel	S	<i>Clifton</i>	40 Winants Hall
Clarke, George Russell	S	<i>New Brunswick</i>	126 Benner St.
Colleran, Thomas Francis†	G	<i>Highlands</i>	17 Mine St.
Cortelyou, Frank Van Deventer	S	<i>Monmouth Junction</i>	Monmouth Junction
Costa, Joseph Louis	S	<i>Jersey City</i>	312 Ford Hall
Davenport, Donald Hills	S	<i>Roselle</i>	Bleecker Place
Davies, Raymond Oliver	S	<i>Brooklyn, N. Y.</i>	541 Ford Hall
Denberg, Harry Lisle	S	<i>Newark</i>	55 Winants Hall
Dumont, William Henry†	A	<i>West Coxsackie, N. Y.</i>	114 College Ave.
Ebert, Burton Erdell	S	<i>Allentown</i>	76 Winants Hall
Eisenberg, Abraham Gottlieb	S	<i>Woodbine</i>	44 College Ave.
Fehon, William Lester†	S	<i>Irvington</i>	241 Ford Hall
Feitner, William Alfred	S	<i>Bloomfield</i>	542 George St.
Foley, Theodore Hampson†	G	<i>Irvington</i>	241 Ford Hall
Fox, Vernon Cartwright†	S	<i>Metuchen</i>	Metuchen
Franklin, Churchill Charles	L	<i>Helmetta</i>	321 Ford Hall
Freeman, Wilber Russell	A	<i>Cranford</i>	118 Winants Hall
French, Elmer Horton†	A	<i>Plainfield</i>	30 Hertzog Hall
Gallagher, Vincent Joseph, Jr.	S	<i>Brooklyn, N. Y.</i>	38 College Ave.
Garrett, Alfred Tennyson	S	<i>Collegeville, Pa.</i>	74 College Ave.
Gidley, Irving Youlen†	G	<i>South Bound Brook</i>	502 George St.
Goldberg, Louis Rand	A	<i>New Brunswick</i>	23 Peace St.
Golden, Abraham†	G	<i>Union</i>	44 College Ave.
Goldfarb, Morris	S	<i>Perth Amboy</i>	44 College Ave.
Goldstein, David	S	<i>Atlantic City</i>	121 Winants Hall
Griffin, Warren Leighton	S	<i>East Orange</i>	221 Ford Hall
Haas, Henry George†	S	<i>Jersey City</i>	542 George St.
Harris, Earl Stretch	S	<i>Hancocks Bridge</i>	542 George St.
Hawthorne, Roy Randolph†	S	<i>New Brunswick</i>	54 Drift St.
Heilmann, Harold Charles	S	<i>Newark</i>	137 Winants Hall

Higgins, Michael Harold	A	<i>Bloomfield</i>	127 Ford Hall
Hock, August William	A	<i>Newark</i>	31 Hertzog Hall
Hollenbeck, Charles Henry	S	<i>Camden</i>	74 College Ave.
Holmes, William Kirby, Jr.	S	<i>Merchantville</i>	18 College Ave.
Huyssoon, Donald James	G	<i>Paterson</i>	38 College Ave.
Iskovitz, Benjamin Harris	S	<i>Woodbine</i>	146 Winants Hall
Jackson, John Kenneth	S	<i>New Brunswick</i>	502 George St.
Jackson, Morris Bacon†	S	<i>Brooklyn, N. Y.</i>	Bleecker Place
Jankelwitz, Jacob	S	<i>Elizabeth</i>	244 Ford Hall
Jones, Enos Frasier	S	<i>Jersey City</i>	231 Ford Hall
Kuyper, George Adrian	A	<i>Paterson</i>	231 Ford Hall
Leber, Morton Adelbert	S	<i>Port Reading</i>	105 Winants Hall
Lefurgy, Hanford Farmer†	S	<i>Hastings-on-Hudson, N. Y.</i>	17 Mine St.
Lindeburg, Alfred†	S	<i>Newark</i>	17 Mine St.
Lukens, Paul Woolman	S	<i>Rahway</i>	17 Mine St.
Lyon, Julian Milton	S	<i>Atlantic City</i>	313 Ford Hall
Lyons, Francis Edward†	A	<i>Gardiner, N. Y.</i>	41 College Ave.
MacNair, John Long	S	<i>Holmdel</i>	31 Winants Hall
Macwatty, Frank Lamont	S	<i>Hasbrouck Heights</i>	Bleecker Place
McWithey, Harold Stanley	A	<i>Warsaw, N. Y.</i>	41 College Ave.
Main, Hermas Victor	S	<i>Perth Amboy</i>	17 Mine St.
Malven, Donald	G	<i>Pleasant Valley, N. Y.</i>	211 Ford Hall
Martin, Brooks Collins	S	<i>Bloomfield</i>	542 George St.
Maxwell, Titus Bonner	S	<i>Brooklyn, N. Y.</i>	41 College Ave.
Merritt, Frank Pearson	S	<i>Red Bank</i>	527 Ford Hall
Miner, Ross Heylmann	A	<i>Brooklyn, N. Y.</i>	74 College Ave.
Moore, Perry Martin	S	<i>Bloomfield</i>	144 Winants Hall
Morgan, Harold Edward	S	<i>Westfield</i>	Westfield
Neuschaefer, Alfred August	L	<i>Newark</i>	66 Winants Hall
Otis, George Sterling†	S	<i>Tuckerton</i>	525 Ford Hall
Ottinger, Garwood Russell	A	<i>Camden</i>	58 Winants Hall
Perkins, Henry Read	G	<i>Haddonfield</i>	77 Hamilton St.
Perry, Edward Davies	S	<i>Ocean Grove</i>	17 Mine St.
Perry, John Richard	S	<i>Red Bank</i>	83 Commercial Ave.
Pfaltz, Hugo Menzel†	S	<i>Newark</i>	434 Ford Hall
Pitt, Malcolm Slack	A	<i>Bridgeton</i>	260 Townsend St.
Post, Charles Irwin	S	<i>East Orange</i>	221 Ford Hall
Prall, George Hargis	S	<i>Woodbridge</i>	105 Winants Hall
Pratt, Lewellyn Neville†	G	<i>Nutley</i>	18 College Ave.

Quimby, Neal Dow†	S	Port Richmond, N. Y.	38 College Ave.
Reese, Charles Elwood	S	Westfield	114 College Ave.
Remsen, Frank Wilbur, Jr.†	S	East Millstone	95 College Ave.
Rendall, Kenneth M.†	S	Jersey City	38 College Ave.
Rice, Austin Melville	S	Flushing, N. Y.	542 George St.
Robeson, Paul Le Roy	A	Somerville	142 Winants Hall
Robinson, Spencer James	S	Stelton	Stelton
Rogers, Henry Wolcott†	S	Maplewood	41 College Ave.
Ruedemann, Dana Werner	S	Albany, N. Y.	31 Winants Hall
Rumohr, Frederick William†	S	Hoboken	502 George St.
Runyon, Mefford Ross	S	New Brunswick	254 Lawrence Ave.
Scheer, Joseph William	S	Newark	38 College Ave.
Schell, Henry Addison	S	Newark	542 George St.
Sebring, Francis Marion	A	Elizabeth	Elizabeth
Seltzer, William	S	Vineland	135 Winants Hall
Shapiro, Maurice Bernard	S	Woodbine	44 College Ave.
Skinner, Alfred Phillips†	G	Madison	95 College Ave.
Sliker, Laurence†	G	Newark	78 College Ave.
Spader, William Van Mater	L	New Brunswick	107 First Ave.
Sprague, Joseph Horace, Jr.†	G	Barnegat	542 George St.
Steeagar, Charles Le Roy†	S	Garfield	18 College Ave.
Stryker, Jaques Marcus	S	Sheepshead Bay, N. Y.	18 College Ave.
Swing, Raymond J. T.	S	Bryn Mawr, Pa.	Bleecker Place
Sykes, Charles	S	Trenton	44 College Ave.
Taylor, Harold Cuyler†	G	East Orange	77 Hamilton St.
Thomas, Howard Haines	S	Moorestown	18 College Ave.
Thompson, Edwin Buckley	S	Upper Montclair	321 Ford Hall
Thompson, James Harold†	S	Newark	95 College Ave.
Thompson, Merrill Hazleton†	S	Meluchen	74 College Ave.
Tiger, Harvey John	S	Bedminster	542 George St.
Trimnell, Marmion Robert†	S	Newfield	502 George St.
Underhill, Jerome Stephenson	S	Lakewood	41 College Ave.
Van Arsdale, John Royle	G	Paterson	Bleecker Place
Van Dyck, Pierre	A	New Brunswick	25 Grant Ave.
Van Fleet, Arthur Kenney†	S	Somerville	38 College Ave.
Van Mater, Pierre Duclos†	S	Plainfield	77 Hamilton St.
Voorhees, Anson Willard†	S	Upper Montclair	39 College Ave.
Wainwright, Benjamin Booth	A	N. Adams, Mass.	244 Ford Hall
Ward, Anton	L	Hackensack	74 College Ave.

Ward, Sheldon Elliott	G	<i>Hanover</i>	40 Winants Hall
Warenreich, Edward David	G	<i>Newark</i>	Newark
Watman, Albert	S	<i>Bayonne</i>	97 Winants Hall
Weller, Walter Cobson	S	<i>Bayonne</i>	542 George St.
Wetterberg, Louis Ferdinand	S	<i>Perth Amboy</i>	521 Ford Hall
Whiting, Edgar La Verne	S	<i>New Brunswick</i>	300 Redmond St.
Whitney, William Graham	S	<i>Bloomfield</i>	314 Ford Hall
Williams, James	S	<i>New Brunswick</i>	Bleecker Place
Wimpenny Cyril	S	<i>Trenton</i>	78 College Ave.
Young, Malcolm Russell†	S	<i>Beesleys Point</i>	141 Ford Hall

FRESHMAN CLASS

Class of 1920

A = A.B. course
L = Litt.B. course

G = General B.Sc. course
S = Technical B.Sc. course

Allmuth, Frank Stirling	G	<i>Paterson</i>	123 Ford Hall
Angus, Bruce Walker	G	<i>Passaic</i>	131 Ford Hall
Archibald, Wilber Thomas	G	<i>Bovina, N. Y.</i>	41 College Ave.
Aspinall, Henry Vernon	S	<i>Firthcliffe, N. Y.</i>	38 College Ave.
Augustine, Harold Mandeville	A	<i>Hackensack</i>	331 Ford Hall
Aydelott, John Charles	S	<i>Pekin, Ill.</i>	214 Ford Hall
Backus, William Henry	A	<i>Bogota</i>	99 Winants Hall
Baisden, Floyd Willard	S	<i>Athens, N. Y.</i>	136 Winants Hall
Baker, Clifford Nelson	S	<i>Salem</i>	542 George St.
Barbehenn, Edwin William	S	<i>Jersey City</i>	87 Winants Hall
Bear, Gustave S.	G	<i>Newark</i>	Newark
Begam, Reuben	L	<i>Irvington</i>	108 Winants Hall
Bingham, George Charles	G	<i>Hartford, Conn.</i>	334 Ford Hall
Boocock, Cornelius Brett	A	<i>Buffalo, N. Y.</i>	77 Hamilton St.
Braunsdorf, Wesley Robert	G	<i>Elizabeth</i>	Elizabeth
Breitkopf, Emanuel	S	<i>New Brunswick</i>	35 Albany St.
Brown, Gordon	G	<i>Montclair</i>	78 College Ave.
Budd, Chester Emmons	S	<i>Budd Lake</i>	63 Winants Hall
Burch, William Dement, Jr.	G	<i>Ventnor</i>	114 College Ave.
Burhans, Edmund Utter	G	<i>Saugerties, N. Y.</i>	102 Winants Hall
Burkhardt, Andrew Alois	A	<i>Newark</i>	23 Winants Hall
Butcher, Charles Henry	G	<i>Cranbury</i>	99 Winants Hall
Cahill, Francis Victor	A	<i>South Orange</i>	502 George St.
Cairns, Graham Hutton	G	<i>Newark</i>	95 College Ave.
Campbell, Herbert Ryerson, Jr.	S	<i>Prospect Park</i>	111 Ford Hall

Campbell, John Francis	S	Belleville	Belleville
Card, Cyrus	G	Hamburg	145 Winants Hall
Casey, Edward Leo	A	Bridgeport, Conn.	343 Ford Hall
Chamberlin, James Stanley	S	East Orange	East Orange
Cheshire, Leslie Roosevelt	L	Oyster Bay, N. Y.	342 Ford Hall
Church, James Edward	S	Dover	543 Ford Hall
Cohen, Emil Zola	G	New Brunswick	R. F. D. No. 4
Cohen, Morris	S	Newark	Newark
Conger, Henry Clay, 3d	S	Orange	534 Ford Hall
Conover, Earle Van Arsdale	G	Asbury Park	18 Hertzog Hall
Cook, Clyde Willard	S	Dover	114 College Ave.
Corrigan, James Patrick	G	Franklin	81 Winants Hall
Craig, Emmett Girard	S	Ventnor	74 College Ave.
Crooks, Archer Duryee	S	Freehold	23 Winants Hall
Cubberley, Chester Curtis	S	Long Branch	34 Winants Hall
Curran, James Joseph	G	New Brunswick	250 Delevan St.
Darwent, Warren John Joseph	S	Cranford	118 Winants Hall
Davenport, Robert Ritter	A	Orange	29 Winants Hall
Davies, Malcolm Frick	G	Brooklyn, N. Y.	542 Ford Hall
Davies, Ward Jackson	G	Philadelphia, Pa.	542 Ford Hall
Davis, Edmund Tomlinson, 2d	G	Upper Montclair	18 College Ave.
Davis, William Frederic	S	West Nulley	411 Ford Hall
Dayton, Arthur Runyon	G	Flemington	27 Hertzog Hall
Dayton, George Henry	S	Brooklyn, N. Y.	114 College Ave.
Dean, Myron Raymond	G	Delaware	142 Ford Hall
De Witt, John Willard	S	Oradell	72 Winants Hall
Dickinson, Abram Becker, Jr.	S	Ridgewood	511 Ford Hall
Drake, LeRoy Spencer	S	New Brunswick	43 Grant Ave.
Dufft, James Henry	G	Mt. Vernon, N. Y.	98 Easton Ave.
Dulany, Franklin Reed	S	Merchantville	516 Ford Hall
Dunham, Richard White	S	New Brunswick	21 First Ave.
Durand, Edwin Martin	S	Rahway	77 Hamilton St.
Edwards, Taylor Harris	G	Saugerties, N. Y.	102 Winants Hall
Efrein, Solomon	G	Perth Amboy	Perth Amboy
Eisenberg, Herman Elkan	A	Rahway	Rahway
Ellinwood, Allen Keith	G	Warsaw, N. Y.	98 Winants Hall
Elliott, Robert Caldwell	S	New York, N. Y.	18 College Ave.
Eschenfelder, Andrew Frank	S	Newark	137 Winants Hall
Feinberg, Harry David	S	Long Branch	George and New Sts.
Feller, John Edward	S	Metuchen	Metuchen
Felton, William Raymond	G	New Brunswick	86½ Bayard St.

Fenton, Paul Fieldhouse	A	<i>Metuchen</i>	18 College Ave.
Fleming, Eric	S	<i>New Brunswick</i>	209 Townsend St.
Fleming, Herbert Richard	S	<i>New Brunswick</i>	Hamilton Ave.
Flitman, Sollie Herbert	S	<i>Newark</i>	55 Winants Hall
Fouquet, Louis Douglas, Jr.	S	<i>Ridgewood</i>	131 Ford Hall
Franke, Walter Edmund	G	<i>Rossville, N. Y.</i>	211 Ford Hall
Frankel, Eli	S	<i>Newark</i>	130 Winants Hall
Froehlich, Harold Max	A	<i>Newark</i>	25 Easton Ave.
Frost, James Monroe	A	<i>Arlington, N. Y.</i>	45 Hertzog Hall
Gelber, Francis	G	<i>Poughkeepsie, N. Y.</i>	1 Winants Hall
Gibson, James Percival	S	<i>New Brunswick</i>	55 Richardson St.
Goldstein, Samuel Alexander	S	<i>Atlantic City</i>	121 Winants Hall
Grass, Andrew Nembach	S	<i>New York, N. Y.</i>	18 College Ave.
Gray, William Gordon	S	<i>Bogota</i>	Bleecker Place
Griffiths, Harold Oswaldt	G	<i>Westfield</i>	114 College Ave.
Growney, Frank James	A	<i>Englewood</i>	26 Winants Hall
Hadden, William MacKinlay	S	<i>Poughkeepsie, N. Y.</i>	41 Hertzog Hall
Hall, Frederick Arthur	G	<i>Asbury Park</i>	411 Ford Hall
Hand, Kenneth Cromwell	A	<i>Keyport</i>	514 Ford Hall
Harad, Herman	S	<i>Newark</i>	Newark
Hasbrouck, John Hutton	L	<i>Brooklyn, N. Y.</i>	78 College Ave.
Hauser, Percy James	S	<i>Highlands</i>	17 Mine St.
Hazel, Homer Howard	S	<i>Homer, Mich.</i>	102 Eighth Ave.
Headley, Russell James	G	<i>Union</i>	Hertzog Hall
Heim, Russell Hunt	G	<i>Roselle Park</i>	502 George St.
Hendrickson, William Henry, Jr.	A	<i>Red Bank</i>	179 Somerset St.
Hershman, Michael M.	G	<i>Brooklyn, N. Y.</i>	98 Easton Ave.
Hickman, Cedric Ashley	G	<i>Asbury Park</i>	18 College Ave.
Hoagland, Lewis Perry	S	<i>Woodbridge</i>	74 College Ave.
Horowitz, Louis George	S	<i>Passaic</i>	44 College Ave.
Houlihan, James Willard			
Christopher	S	<i>Long Branch</i>	34 Winants Hall
Howard, Joseph Adolf	S	<i>New Brunswick</i>	20 Abeel St.
Hubbard, John Gardiner	S	<i>Allendale</i>	71 Winants Hall
Illig, Rudolph Frederick, Jr.	S	<i>Bronx, N. Y.</i>	121 Winants Hall
Intiso, Dominic	S	<i>Orange</i>	Orange
Jackson, James Draper	S	<i>Cape Charles, Va.</i>	502 George St.
Johnston, John Harold	G	<i>Ridgewood</i>	81 Winants Hall
Karp, Joseph Joshua	A	<i>Chrome</i>	Chrome
Keane, Leo Albert	S	<i>Elizabeth</i>	98 Easton Ave.
Keffer, John Henry	S	<i>Bayonne</i>	502 George St.

Kelley, Frank Benedict	G	<i>New Canaan, Conn.</i>	38 College Ave.
Kelly, David	G	<i>New Brunswick</i>	114 College Ave.
Kleinhans, Rufus Edgar	S	<i>Perth Amboy</i>	Perth Amboy
Knowlton, John Russell	L	<i>Ridgewood</i>	443 Ford Hall
Koyen, William Henry	S	<i>Woodbridge</i>	113 Winants Hall
Kramer, Samuel Emanuel	G	<i>Perth Amboy</i>	44 College Ave.
Lakens, Charles Alfred	S	<i>Wilmington, Del.</i>	38 College Ave.
Lamb, George Edward	G	<i>Hasbrouck Heights</i>	66 Winants Hall
Langwith, Sanford Ricardo	S	<i>Oceanport</i>	46 Hertzog Hall
Lauber, Albert	G	<i>Haledon</i>	534 Ford Hall
Lawes, Charles Osborne	G	<i>Montclair</i>	134 Winants Hall
Lawes, Ernest Frederick, Jr.	S	<i>Upper Montclair</i>	134 Winants Hall
Lecraw, Loring Ross	L	<i>Plainfield</i>	214 Ford Hall
Letson, Walter Colburn	S	<i>Sielton</i>	Stelton
Lilly, George Belwood	S	<i>Ridgewood</i>	511 Ford Hall
Lindemer, Carl, Jr.	G	<i>Trenton</i>	111 Ford Hall
Linsky, Harold	G	<i>Carteret</i>	Carteret
Lippincott, Jesse Ralston	G	<i>Newark</i>	431 Ford Hall
Loder, Joseph Shimer	G	<i>Perth Amboy</i>	Perth Amboy
Losee, James Knickerbocker	G	<i>Upper Red Hook, N. Y.</i>	77 Hamilton St.
Lowenkopf, Leo Simon	G	<i>Keasbey</i>	51 Church St.
Lynch, Andrew Francis	S	<i>Jersey City</i>	108 Winants Hall
McBride, Leon Cornelius	S	<i>Princeton</i>	38 College Ave.
MacKenzie, Ernest Speakman	L	<i>Westwood</i>	114 College Ave.
McMahon, Arthur William	G	<i>New Haven, Conn.</i>	17 Mine St.
Martin, Warren Shepard	L	<i>Hasbrouck Heights</i>	78 College Ave.
Mead, George Adriance	S	<i>Upper Montclair</i>	124 Winants Hall
Metz, Charles, Jr.	S	<i>Newark</i>	Newark
Meury, Calvin Christian	A	<i>Jersey City</i>	47 Hertzog Hall
Miller, John Lloyd	S	<i>Hightstown</i>	43 Winants Hall
Müller, John Malcolm	G	<i>Elizabeth</i>	Elizabeth
Molineux, Walter Lang	A	<i>Metuchen</i>	38 College Ave.
Money Penny, Harold Clifford	S	<i>Ridgewood</i>	95 College Ave.
Morrell, Joseph Cornelius	S	<i>White Plains, N. Y.</i>	77 Hamilton St.
Mount, Wilton Edgar	L	<i>Englishtown</i>	114 College Ave.
Neely, Harold Marsland	S	<i>Dunellen</i>	414 Ford Hall
Nobbe, Allen Wirtz	G	<i>Newark</i>	414 Ford Hall
Noble, Richard Thornton	G	<i>Kearny</i>	502 George St.
Norris, James Cox, Jr.	S	<i>Hightstown</i>	43 Winants Hall
O'Brien, Raymond Francis	S	<i>Elizabeth</i>	Elizabeth

Oxley, Joseph Charles	S	Long Branch	34 Winants Hall
Packard, Preston Kinney	S	New Brunswick	R. F. D. No. 5
Parker, Henry Griffith, Jr.	A	New Brunswick	165 College Ave.
Patterson, Edward John	G	Arlington	Arlington
Peirce, Allen Flitcraft	S	Westfield	95 College Ave.
Pelaez, Antonio R.	S	Colombia, S. A.	94 Easton Ave.
Petit, Francis William	S	Dunellen	Dunellen
Pidgeon, Brainerd Schuyler	G	North Troy, N. Y.	102 Winants Hall
Pierce, George Edward, Jr.	S	Hasbrouck Heights	431 Ford Hall
Plain, Frank Abraham	G	Perth Amboy	Perth Amboy
Potter, Richard Freeman	G	New Brunswick	66 Harrison Ave.
Prove, George Washington	S	New Brunswick	422 George St.
Quigley, John Turnbull	S	East Orange	421 Ford Hall
Reed, Shvler Bertram	S	New Brunswick	201 Livingston Ave.
Rice, Charles Walter	A	Passaic	220 Lawrence Ave.
Robinson, John Ernest	G	Bound Brook	114 College Ave.
Ross, Millard Fillmore, Jr.	G	New Brunswick	100 Livingston Ave.
Rowe, Edward James	S	Franklin	542 George St.
Rubin, Michael Frankel	G	East Orange	12 Drift St.
Ruck, Walter	S	New Brunswick	305 Neilson St.
Rue, Wilbur Fowler	S	Allentown	543 Ford Hall
Rugen, Benjamin Ralph	S	Bound Brook	38 College Ave.
Rule, George Benjamin	S	New Brunswick	10 Union St.
Rusby, Robert Holmes	G	Raritan	Raritan
Salm, Raymond Welch	S	Elizabeth	38 College Ave.
Saxe, Amos Howard	G	Catskill, N. Y.	81 Winants Hall
Schlain, Benjamin Howard	S	Newark	55 Winants Hall
Scott, Carl Gustave	G	Englewood	26 Winants Hall
Shapiro, Louis	S	Newark	77 Winants Hall
Sheridan, Dudley H.	G	Newark	95 College Ave.
Sibley, Leonard Augustus	A	Passaic	43 Hertzog Hall
Siegel, Louis	A	Newark	Newark
Smith, Perry Dickerson	S	Jamesburg	Jamesburg
Smyth, George Augustus	S	Jersey City	502 George St.
Sniffen, Stewart Braisted	G	White Plains, N. Y.	77 Hamilton St.
Stahl, Robert Henry	L	Irvington	108 Winants Hall
Storck, Donald George	S	Hasbrouck Heights	Bleecker Place
Summerill, John Morris, Jr.	S	Penns Grove	38 College Ave.
Sutton, John Jackson	G	Warsaw, N. Y.	98 Winants Hall
Swing, Harry P.	S	Bryn Mawr, Pa.	124 Winants Hall
Taliaferro, Leland Lee	A	Atlantic City	23 Winants Hall

Talmage, George Edwin, Jr.	A	Oyster Bay, N. Y.	114 College Ave.
Tattersall, John Ellison	G	Paterson	114 College Ave.
Thevenet, Arthur Edwin	L	Newark	98 Easton Ave.
Thompson, Peter Martin	S	Port Reading	113 Winants Hall
Tilton, Herbert Onyx	S	Eatontown	38 College Ave.
Tomlinson, Harry David	S	Bridgeton	343 Ford Hall
Van Orden, Ralph P. S.	G	Ridgewood	18 College Ave.
Voorhees, Foster Mahlon	L	Trenton	Trenton
Voorhees, Ralph Spencer, Jr.	S	Brooklyn, N. Y.	32 Hertzog Hall
Vose, Richard Shepard	S	Newark	73 Winants Hall
Vose, Rodney Seager	S	Newark	73 Winants Hall
Wallace, John Henry	G	Rutherford	18 College Ave.
Walrath, Raymond Livingston	S	Brooklyn, N. Y.	443 Ford Hall
Weisel, James Conrad	G	Newfoundland	172 College Ave.
Weller, Samuel Joseph	G	Brooklyn, N. Y.	98 Easton Ave.
Whitehill, John Swan, Jr.	G	Rutherford	18 College Ave.
Wilcox, Howard Spencer	G	Jersey City	113 Winants Hall
Wortendyke, Howard Blakesley	G	Jersey City	63 Winants Hall

SPECIAL STUDENTS

Not candidates for a degree

Hansen, Harry Morris	S	Metuchen	Metuchen
Turner, Eric Wilfred	S	Trenton	Trenton

SUMMARY

Graduate Students.....	27
Seniors, Class of 1917.....	76
Juniors, Class of 1918.....	90
Sophomores, Class of 1919.....	139
Freshmen, Class of 1920.....	205
Special Students.....	2

SUMMER SESSION, 1916

* Holding teacher's certificate

Abt, David Milton Paul	Hasbrouck Heights
Albee, Cleveland Q.	Colonia
Alden, Harriet	Metuchen
*Alford, Douglas Scott	West Orange
Allen, Mildred Frances	South Amboy
Althenn, Henry John	Newark
B.S., Muhlenberg College	
Anderson, Nellie Louise	Dover
Angle, Elisha	Finesville
*Applegate, Mrs. Charles Milton	Flanders
Applegate, Dorothy Rule	New Brunswick
Applegate, Melbourne Sanford	East Orange
*Archibald, Ella Messler	Hightstown
*Arleth, Emma	Sayreville
Atkinson, Sarah	New Brunswick
Aychen, Bessie	Perth Amboy
*Ayers, Amy Marshall	Elizabeth
*Bahrenburg, Elsie Dorothea	Hazlet
Bailey, Myrtle Esylvia	Keyport
Baird, Karl Oliver	Freehold
Barbour, Edna	New Brunswick
Baremore, Bessie	Jamesburg
B.A., New York State Teachers' College	
Barnard, Ray Alfred	Plainsboro
Litt.B., Princeton University	
Barnett, Layton	Newark
Barrall, Marjorie	Secaucus
*Bartine, Ella Amelia	Ocean Grove
*Bartle, Chrissie Middleton	New Brunswick
Bateman, Mildred	Cedarville
*Beam, Kate F.	Phillipsburg
*Beamer, Edith Estelle	Long Branch
Beavers, Geraldine Latimer	Somerville
Beckwith, Frank Samuel	New Brunswick
*Behler, Charles Franklin	Campgaw
*Bell, Matthew	Morristown

*Bellis, Sara Elizabeth	Ringoes
*Bender, Mary Ellen	Somerville
*Bennett, Mabel L.	Dunellen
A.M., Cornell University	
Bergen, Frederick W.	New Brunswick
Black, Mrs. Minnie	Weehawken
*Black, Saidee Matheson	Bogota
*Blanchard, Helen Bradley	Ocean Grove
Blatt, Sara	Perth Amboy
*Bliven, Minnie Caroline	Bloomfield
*Bock, Amy Dorothea	Newark
*Bollin, Elsa Emily	Newark
Booraem, Mrs. T. B.	New Brunswick
Botthof, Rose	New York, N. Y.
Bracher, Elmer Gladstone	Rahway
Brady, Ella Miller	Elmer
Brien, George Mandeville	Orange
Briskie, Estelle	South Amboy
Broffe, Daisy Pauline	New Brunswick
*Brookfield, Mabel Howe	Newark
*Brown, Agnes Estelle	Willimantic, Conn.
*Brown, Marie Easter	Tottenville, N. Y.
*Brown, Sarah T. M.	South River
Bruce, Charlotte Stone	North Bergen
Bruck, Irene	Perth Amboy
Bryan, Jessie Elizabeth	Three Bridges
*Buffington, Emory Adam	Bloomfield
Bullen, Mrs. Grace R.	Newark
*Bundy, Grace A.	Trenton
Bursch, Robert Hardy	Brooklyn, N. Y.
*Burt, Leroy Padgett	Elmer
*Byrnes, Margaret	Elizabeth
*Cain, Llewella Melba	East Orange
*Call, Mary Caroline	Chester
Campbell, Theodore Carman	Metuchen
*Carey, Mary Frances	Rutherford
Carney, Homer Eugene	New Brunswick
A.B., Miami University	
*Carr, Rachel Davison	Wrightstown
Carroll, Richard Francis	South Amboy
Carroll, Wallace	Dayton

*Castner, Iva E.	Glen Gardner
Cella, Rose A.	Hoboken
*Chapman, Harriet May	Bordentown
Charaway, Mrs. Frederick	New Brunswick
Childs, Walter Leland	Hackensack
Clark, Dorothy Snow	Newark
Clark, Robert Irving	Montclair
*Clarke, Ada Hamilton	Plainfield
Clayton, Mrs. Elsie M.	Toms River
Clifton, Geoffrey Basil	New Brunswick
Cobb, Eleanor	Newark
Cohn, Julius Henry	Newark
*Coker, Florence	South Amboy
*Cole, Alice Thatcher	Vineland
Coles, Mabel	Elmer
*Collins, Elizabeth Marie	Trenton
*Conant, Florence	Newton
A.B., Wells College	
*Conkling, Elizabeth Cornelia	Long Branch
*Conkling, Jessie Ray	Cedar Run
Conlon, Elizabeth	New Brunswick
*Connolly, Hanna A.	High Bridge
*Connor, Margaret	Perth Amboy
Conover, Lillie May	Whitehouse
Conrad, Cooper Predmore	Barneгат
Coogan, James Francis	Harrison
A.B., St. Peters College	
*Coomey, Marjorie Catherine	Carteret
*Coover, Vincent Morrett	Woodbridge
Corby, Evelyn Elizabeth	Boonton
*Cowan, Eleanor E.	Beverly
*Craig, Emilie Blanche	Haddonfield
*Cramer, Cora Stella	Annandale
*Cranstoun, Jeanette Rose	Jersey City
*Crawford, Mary Campbell	Belle Mead
Crawford, Robert Wallace	East Orange
Croker, Byron Pennington	Wildwood
*Cronce, Georgiana	Woodbridge
*Crowell, Mary Etta	East Orange
A.B., Smith College	
*Cubberley, Heber M.	Plainfield

Cummings, Elizabeth	Bound Brook
Cummings, Lilian	Bound Brook
Curley, Madelyn Louise	Bayonne
Currey, Lyda A.	Weehawken
Dalrymple, Charles E.	New Brunswick
Daly, Margaret Mansfield	New Brunswick
Davis, Elizabeth Kidder	New Brunswick
Davis, Ida Ahletta	Carteret
Dayton, George Henry	Brooklyn, N. Y.
Dede, Marion Zelia	East Orange
*DeGraw, Carrie Amelia	Rahway
DeLamater, John Sherman	Hudson, N. Y.
Della Volpe, Domenic Vincent A.	Jersey City
*Demarest, Daisy Estella	Newark
*Demarest, Lillian Blauvelt	Hackensack
*Deshler, Marjorie	New Brunswick
*Devereux, Anna Regina	Chrome
*Dewald, Bertha	New Brunswick
Dewald, Ernest Theodore	New Brunswick
A.B., Rutgers; A.M., Ph.D., Princeton University	
*Dewald, Martha Louise	New Brunswick
*De Witt, Anna	Oradell
*De Witt, Mary Veldram	Oradell
*Dittmar, Elsie Elizabeth	Freehold
*Doctor, Ruth	Newark
Doggett, Sidney Herbert	East Orange
Donohue, Elizabeth Haviland	New Brunswick
*Dooling, Mary Veronica	Trenton
*Douress, Elizabeth Marie	Trenton
Doyle, Anna	Perth Amboy
Drugan, Wilbur Charles	Trenton
*Duffy, Marcella	Florence
Dunham, Richard White	New Brunswick
*Dunham, Viola Estelle	New Brunswick
*Dunkerley, Elsie	Paterson
Dunn, Olive L.	New Brunswick
Durham, Elizabeth Wyckoff	New Brunswick
Duryee, Mrs. Julia Janeway	New Brunswick
*Dutcher, Ella Woodruff	Passaic
A.B., Adelphi College	
Eastburn, Muriel Constance	New Brunswick

Eick, Emily	Flemington
Ellis, Gladys Lindell	Metuchen
*Ely, Evalyn Mount	Cranbury
Engels, Alice	Newark
Engels, Grace Williams	Newark
*Ensign, Helen Virginian	Woodbridge
*Eppinger, Charlotte Augusta	South River
*Euler, Alma Elizabeth	Elizabeth
*Evaul, May E.	Camden
Everson, Blanche Hathaway	New Brunswick
Fargel, Henry George	Jersey City
*Farwell, Ethel Elizabeth	Stirling
Fash, Alice Mary	Elizabeth
Feldbaum, Max	Spotswood
Fenton, Paul Fieldhouse	Metuchen
Ferguson, Alexander Ernest	Springfield
*Fillips, Susan Maria	Metuchen
Fisher, Mrs. Douglas Judson	Sayreville
A.B., Vassar College	
*Fisher, Harriet Mott	New Brunswick
*Fisher, Laura May	Washington
Fisher, Nannie Virginia	Plainfield
*FitzGibbon, Gertrude Mary	Jersey City
*Fitzherbert, Alice Luranah	Dover
*Fitz-Maurice, Helen Claire	Trenton
Fleming, Herbert Richard	New Brunswick
*Fleming, Ida Hageman	Somerville
*Flinn, Mrs. Marietta Clark	Elizabeth
*Fogg, Ruth	Elmer
*Folsom, Josephine	Westfield
*Forman, Carrie Alice	Trenton
Fouquet, Louis Douglas, Jr.	Ridgewood
*Franke, Elisabeth Emilie	Bound Brook
*Freeman, Augusta Stockton	Metuchen
*Frizelle, Marion Adelaide	Long Branch
A.B., New York University	
*Fulton, Bertha Sofield	South Amboy
Gallagher, Vincent Joseph, Jr.	New Brunswick
*Gardiner, Priscilla Elizabeth	Moorestown
*Gardner, Allene	Morristown
Gardner, Evelyn Gladys	Succasunna

*Gardner, Jean	Morristown
*Garland, Kate Conover	New Brunswick
Garrett, Alfred Tennyson	New Brunswick
Garris, Florence Clair	Newton
Gates, Esther Louise	Newark
*Gaventa, Myrtle H.	Swedesboro
Geary, Elizabeth	Plainfield
*Geary, Nellie Theresa	South Plainfield
*Genther, William Lanpry	Paterson
*Gidley, Mrs. Corrie Blinn	South Bound Brook
Gilligan, John L.	New Brunswick
*Gilligan, Katharine E.	Kearny
*Gilmartin, Catherine	New York, N. Y.
Glennie, Alexander Cowles	Newark
*Goas, Howard Luther	West Orange
A.B., Princeton University	
*Goeres, Louise	Haledon
*Goodchild, Mary Ellen	New Brunswick
*Goodell, Ellen Virginia	Flemington
*Gosling, Ruth Felice	Millburn
*Gould, Susan M.	Point Pleasant
*Govern, William H.	Yonkers, N. Y.
Graeber, Morton	Meriden, Conn.
Granger, Lucy C.	Flemington
Green, Edna Holley	New Brunswick
Greene, Marian Henrietta	Old Bridge
Gregory, Mildred Geraldine	Newark
A.B., Wellesley College	
*Griffin, John Joseph	Hoboken
*Griffin, Marguerite	Matawan
*Griffiths, Harold Oswaldt	Westfield
Grimme, August Louis	Irvington
Gronheit, Ruth	Newark
Grosklaus, Olive	Jersey City
Haas, Henry George	Jersey City
*Hamill, Margaret C.	Jersey City
Hampton, Lula	Flemington
*Hance, Elizabeth	Bayhead
*Hance, Florence	Bayhead
*Hand, Molly Williams	Keyport
Hann, William Hamilton	Raven Rock

Hanson, Aimee Dorothy	Perth Amboy
Hanson, Harry Morris	Metuchen
Harkins, Margaret	New Brunswick
Hart, Mrs. Charles H.	New Brunswick
*Hegel, Lizzie C.	Newark
Heilmann, Harold Charles	Newark
Heilmann, William	Newark
*Heineken, J. F. D.	Milltown
Heiser, Oliver Raymond	Englishtown
*Hemmendinger, Rosamond	Newark
*Henderson, Jessie Eva	South River
Herben, George Foster	Westfield
Herschberg, Frieda	West New York
*Hershfield, Elizabeth	Jersey City
Higgins, Ernest Stout	Plainfield
*Higgins, Louise Alberta	Hoboken
Hildebrant, Ethel Mae	Flanders
*Hill, Mrs. Nellie Vanderbilt	Perth Amboy
Hiller, Richard Bevier	Hurley, N. Y.
B.Sc., Rutgers	
Hoe, Katharine Hubbard	New Brunswick
*Hoffman, Mildred Marie	Riegelsville
*Hoffmann, Jeanette	Irvington
Hollinshead, Earl D.	Medford
*Holmes, Jennie Warner	Arlington
*Holton, Mrs. Helen Manson	Cranbury
*Hoolan, Irene Catherine	Highlands
Hourigan, Bessie	Wharton
Howell, George Brokaw	New Brunswick
*Hummel, Mimi	Dover
*Hunter, Emma Lillian	Haddonfield
*Hymes, Helen	Bordentown
Ingling, George Warren	New Brunswick
*Iorio, Jane	Flemington
*Ireland, Maud	New Brunswick
*Irons, Lilyan Alberta	Burlington
Jackson, Fred Walter	Summit
Jackson, James Draper	New Brunswick
Jackson, Minnie Luella	Paterson
Jackson, Morris Bacon	Fair Haven
*Jacobi, Irene Louise	Newark

Jacobi, Lilian Albert	Newark
*Jacobson, Emily	Perth Amboy
Jamieson, Gladys	Elizabeth
Janeway, Harry Latimer	New Brunswick
Janeway, Helen Rodney	New Brunswick
Janeway, Katharine	New Brunswick
Jessick, Mary Amy	Elizabeth
*Johnson, Clara May	Moorestown
*Johnson, Frances Hall	Bradevelt
Johnson, John William	Stanton
*Johnston, Anita Murdock	Atlantic Highlands
*Johnston, Blanche Maude	New Brunswick
Jones, Edward Henry, Jr.	Newark
A.B., Wesleyan University	
Jones, Enos Frasier	Jersey City
Jones, Marie Grace	New Brunswick
Jones, Rachel Dorothea	Elizabeth
Jones, Rose Frances	Morristown
Karlson, Helge T.	Brooklyn, N. Y.
Karshmer, Fannie	New Brunswick
*Keisling, Anna S.	Parlin
Kelly, John Thomas	New Brunswick
*Kelly, Zella Louisa	New Market
*Kennedy, Alice Agnes	West Hoboken
*Kennedy, Mary E.	Trenton
Keyes, Philip Bradford	Westfield
Kilmer, Eleanor	New Brunswick
*Kingsland, A. Edith	Roselle Park
*Klingerman, Emma May	Somerville
*Koehler, Lydia	Newark
Koppermann, Mrs. Edith Stephens	West Nyack, N. Y.
*Kuhnle, Lulu Steinman	Woodbury
Kuntny, Ilse	Trenton
Kyle, Mae	New Brunswick
Lafferty, Pearl Lola	Monroeville
*Lake, Agnes	Guttenberg
Lake, Lulu	Guttenberg
Lance, Jeanette Florence	New Germantown
Laury, Mrs. Emma Martha	Metuchen
Law, Josephine Lang	Bayonne
*Layer, Mabel Sinclair	Morris Plains

*Ledwon, Edna Marie	South River
*Lee, Georgetta	Plainfield
*Lee, Linette Esther	New Brunswick
*Leed, Regina M.	New York, N. Y.
*Leigh, Mrs. Alice	North Plainfield
Letson, Walter Colburn	Stelton
Levenson, Sara Aurelia	Elizabeth
*Leyser, Olive Jefferson	Hillside
*Lindabury, Iva D.	Bartley
Linker, Sophie	Elizabeth
*Littell, Anna Lillian	Scotch Plains
Little, Mary	Hammonton
Lochner, Ralph Louis	Newark
Lockwood, Helen B.	East Millstone
*Lockwood, Jeannette Wyckoff	New Brunswick
*Lowe, Mrs. Hannah Pierce	Trenton
Ludlow, Alwilda May	Haddonfield
*Luker, Minnie Clayton	Freehold
Lupton, Sidney Reeves	Sea Girt
Lyons, Marguerite	Elizabeth
*MacAvoy, Hilda	New Brunswick
McElroy, Matilda Todd	North Bergen
McFadden, Edna M.	East Millstone
McGinley, Annette Margaret	Plainfield
McGovern, Agnes Regina	New Brunswick
McGovern, Raymond H.	New Brunswick
McGowan, Josephine	Woodbridge
McKee, George Chesebro	Farmington, Conn.
McLaughlin, Elizabeth	Flanders
McLaughlin, Helen I.	Trenton
*Maclay, Lillian	Plainfield
A.B., Mount Holyoke College	
McLean, Harry C.	New Brunswick
B.Sc., Kansas Agricultural College	
M.Sc., Rutgers	
McManus, Margaret E.	New Brunswick
Macom, Evelyn Maud	New Brunswick
McQuade, Francis Andrew	Newark
A.B., Seton Hall College	
Macwatty, Frank Lamont	Hasbrouck Heights
Magee, Mildred Grant	South Amboy

Mallett, Grace	Perth Amboy
Mandel, Arthur C.	New Brunswick
*Mantz, Nellie	Plainfield
Markert, Frieda	Flemington
Martenis, Florence Lauretta	Plainfield
Martin, Adele Crawford	New Brunswick
A.B., Wellesley College	
*Martin, Esther Luella	Newark
Martin, Robert Van Emburg	Hasbrouck Heights
*Masso, Josephine	New Brunswick
*Mayers, Grace	Irvington
*Mayhew, Erva Turner	Elmer
Meier, Frank Anthony	Newark
Melnick, Sally	Hoboken
Metcalf, Arthur Costello	New Brunswick
B.Sc., M.Sc., Rutgers	
Meyer, Helen Mitchell	Newark
*Meyers, Bessie	Milltown
Middleton, Helen B.	Rutherford
Miller, Anna	East Orange
Miller, Joseph A.	Metuchen
Miller, May	Elizabeth
Mishell, Edward	Glen Ridge
Mitchell, Alice Josephine	Hoboken
*Mitchell, Charles Richard, Jr.	Trenton
Mitchell, George Henry	Dover
*Mitchell, Irene Bunn	Pittstown
*Mitchell, Jean	Moorestown
Mooney penny, Harold Clifford	Ridgewood
Moodey, Ruth Naomi	Morristown
Moody, Robert Andrew	New Brunswick
*Moore, Alice Linda	Newark
Moreau, Daniel Howard	Freehold
Morse, Henry B.	Danvers, Mass.
B.Sc., Massachusetts Agricultural College	
*Moser, Laura Hester	Bloomfield
Mount, Elston Cuyler	New Brunswick
*Mountz, Harry W.	Spring Lake
Ph.B., Ohio Northern University	
*Mowery, Albert	Roselle Park
*Mundinger, Frederick George	Collingswood

*Murphy, Catherine	Morristown
Myers, Elsie	Flemington
Nalitt, Jacob	Bayonne
*Nelson, Flora Louise	Weehawken
*Newmyer, Kathryn	South River
*Newmyer, Mae R.	South River
Newton, Mrs. Walter Russell	New Brunswick
Nichols, Royal Franklin	New Brunswick
*Nufiez, Inez-Isabel	Newark
Olin, Max	Iselin
O'Mara, Arthur James	Brooklyn, N. Y.
B.S., New York University	
O'Niel, William C.	Dunellen
*Osborn, Henrietta Martin	Dayton
Otis, George Sterling	Tuckerton
Owen, Earle J.	New Brunswick
B.Sc., M.Sc., Rutgers	
Oxenford, Bishop Adair	Metuchen
*Packard, Mrs. Asa Judson	New Brunswick
Packard, Preston Kinney	New Brunswick
*Paddock, Mrs. Sadie	Hope
Painter, Harriet	Westfield
*Pardoe, Lucy	Princeton
Pardoe, Nellie Evaline	Princeton
Parish, Curtis Elmer	Nutley
*Park, Chester Bradford	Roselle Park
*Park, Mrs. Chester Bradford	Roselle Park
*Parker, Alma Taylor	Somerville
*Parker, Ednah Hepburn	Point Pleasant
*Parker, Emma Byrel	Dover
*Parker, Robert Craig B.	Freehold
Parnes, Julius Alfred	Elizabeth
Pateman, Mrs. Lily S.	Perth Amboy
Patten, Marion Eudora	Milton, N. Y.
Patterson, Harry Edwin	Freehold
Patz, Gustav	Newark
*Peacock, Reba May	Plainfield
*Pearce, Helen	Plainfield
A.B., Smith College	
Perkins, Henry Read	Wildwood Crest
Perry, George Herbert	Ocean Grove

*Petit, Clementine Augusta	Dunellen
Pfeil, Alfred Schanze	East Orange
*Philhower, Elizabeth	Pottersville
*Pierce, Julia G.	Paterson
B.S., Columbia University	
Pixley, Louisa Grace	Lakewood
*Pixley, Sophia A.	Lakewood
*Porte, William Solomon	Somerville
B.Sc., Rutgers	
Post, Clifford Frederick	Port Jervis, N. Y.
Litt.B., Rutgers	
Potter, Richard Freeman	New Brunswick
*Powell, Grace K.	Montclair
Powell, John Kingsley	Metuchen
*Preston, Mabel	Matawan
*Price, Myrtle Louise	Chatham
Prickitt, Charles N.	Metuchen
Prigge, Anna J.	Jersey City
Provost, Marian	New Brunswick
Pyles, Ada Louise	Vienna
Quimby, Neal Dow	New Brunswick
*Rankin, Herbert Bell	Perth Amboy
Raub, Emma Matilda	Bound Brook
*Read, Mrs. Lucia Vail	Atlantic City
Reed, Eliza Maria	Brooklyn, N. Y.
*Reed, Mary Catherine	North Bergen
Reed, Shivler Bertram	New Brunswick
Reeve, Elizabeth Landrine	Elizabeth
*Reid, Lillian Phoebe	Freehold
Reilly, Mrs. Gabrielle	New Brunswick
Reiss, Raymond H.	Deal
Remsen, Frank Wilbur, Jr.	East Millstone
*Remster, M. Elizabeth	Alloway
Rennick, Meta Kennedy	Morristown
*Reynolds, Emily	Trenton
*Reynolds, Maude	New Brunswick
Riordan, Margaret M.	Harrison
*Robbins, Maude H.	Trenton
Roberson, Elinor Wilson	Bayonne
A.B., Smith College	
Robins, Dorothi Oakley Foster	Metuchen

*Roche, Helen Cecilia	Arlington
*Rockwell, Edith	Weehawken
Rogers, Gladys Janet	Elizabeth
*Rosser, Ceridwyn	East Orange
*Rudiboc, Mari Bryan	Fords
Ruff, Bernice Charlotte	Belleville
*Rugen, Alice Pauline	Bound Brook
*Rule, Carrie Stillwell	New Brunswick
Rumohr, Frederick William	Hoboken
*Runyon, Charles	New Brunswick
B.S., Colgate University	
Runyon, Katharine	New Brunswick
*Russell, Harriet Isabel	Cranford
*Russell, Margaret Norris	Plainfield
Sabelson, Agnes	Newark
Sachs, Elsie C.	Cliffside Park
*Samsel, Catherine	Sayreville
*Sanders, Nan	Laurel Springs
Santner, Jack T.	Elizabeth
Saulsberry, Elizabeth Dorothy	New Brunswick
*Sawn, Ethel May	Palmyra
Scarr, Francis Joseph	Hasbrouck Heights
*Schenck, Evelyn G.	Brookside
Schenck, Maud Haring	New Brunswick
Scherrer, Caroline Marie	New Brunswick
*Schirm, Tillie	Guttenberg
*Schlachter, Marie Elizabeth	Milltown
*Schlicht, Lena	West New York
*Schlis, Mary Elizabeth	Bound Brook
Schneeweiss, Catharine Hardenbergh	New Brunswick
*Schoenly, Bessie May	Dayton
*Schoof, Emma Frieda	New Brunswick
*Schulhoff, Helen	Red Bank
Schwarze, Carl Alois	New Brunswick
B.S., University of Missouri	
M.S., Columbia University	
*Scudder, Laura	Cranbury
*Sculthorp, Ella Emily	Red Bank
Seidman, Edwin Arthur	Newark
Seidman, Herbert Walter	Newark
*Selover, Jesse	South River

*Serman, Mae	Bronx, N. Y.
*Seufert, Eugenia Theresa	Hoboken
Seward, Walter Hamilton	Vineland
*Sexton, Mary Theresa	Chrome
*Seyd, Freda Ernestina	Hoboken
Shaffer, Harry	Atlantic Highlands
*Shann, Gertrude Winters	Kingston
*Sharp, Vira	Bartley
*Shaw, Grace M.	Milltown
Sheehan, Hanora Genevieve	Elizabeth
Shoe, John Martin	Roselle Park
Shorter, Robert Andrew	East Orange
*Siemons, Emma	New Brunswick
Simpson, Clinton Fisk	Whitings
*Skiff, Monnie M.	Woodcliff Lake
Sliker, Laurence	Newark
*Sloan, Marilda Ramsey	Lebanon
Slobodien, Bessie	Perth Amboy
Smith, Agnes Elizabeth	Perth Amboy
Smith, Mrs. David Arthur	Jamesburg
*Smith, Elizabeth Frances	South River
*Smith, Florence Louise	Jamesburg
A.B., Moravian College	
Smith, Frances	New Brunswick
Smith, Gretchen von Meske	New Brunswick
*Smith, Katherine Teresa	South River
*Smith, Lena Josephine	Dover
*Smith, Louise	Jamesburg
A.B., Moravian College	
Smith, Mary Louisa	New Market
*Smith, Reba Anna	Trenton
Smith, Samuel Wilson, Jr.	Kearny
*Smith, Theresa	South River
*Snediker, Bertha Estella	Milltown
*Snediker, Katharine	Milltown
*Soper, Meta Florence	Metuchen
*Souder, Mrs. Laura Herbert	Mays Landing
Spader, Mary Louise	New Brunswick
*Speer, Eva J.	Nutley
*Sprague, Pearl Gladys	East Orange
*Stanley, Helen A.	Paterson

*Steelman, Florence M.	Wildwood
*Steelman, Fred Grant	Eatontown
*Stein, Floyd S.	New Brunswick
Steinel, Margaret Marie	Weehawken
A.B., Hunter College	
*Stephens, Gladys Marie	German Valley
Stevenson, Edward	New Brunswick
*Stevenson, Emma Edith	Moorestown
Stevenson, Katharine L.	New Brunswick
*Stillhamer, Esther	Morsemere
A.B., Wellesley College	
*Stillwell, Mae	Freehold
Stohr, Emma R.	New Brunswick
*Story, Edith Alice	Rahway
*Struble, Ruth Edna	Newton
Stubenrauch, Walter Harman	Hoboken
Sullivan, Mary Veronica	Elizabeth
Summerill, John Morris, Jr.	Penns Grove
Sutton, Lillian Gertrude	Califon
*Swackhamer, Mrs. Emma Elizabeth	Metuchen
Symons, Wilfrid Lawson	Somerville
Taft, Mildred Eva	Chester, N. Y.
Talley, Mrs. Mary	New Brunswick
*Taylor, Helen Marie	Hoboken
*Taylor, Lulu Mitchell	Schooleys Mountain
Ten Broeck, Mrs. Charles Walker	Parlin
*Terhune, Margaret	New Brunswick
*Thomas, Nelly Donnelly	Millville
Thompson, Estella	Freehold
*Thompson, Leila	Freehold
Thomson, John Harold	Middlebush
Tiedemann, Marie	Bound Brook
*Tierney, Teresa	Paterson
*Titus, Charles Augustin	Rahway
Litt.B., Rutgers	
*Tomer, Frank M.	New Brunswick
*Tracy, Mamie Frances	New Brunswick
*Train, Eleanore Howell	Succasunna
A.B., Syracuse University	
*Tupper, Reba Ann	Palmyra
*Tyler, Idella	Keyport

Vaill, Mary Edna	New Brunswick
Vakeel, Abeel H.	Senneh, Persia
*Valentine, Elizabeth Sloan	Magnolia
*Van Arsdale, Estelle	South River
Van Dyck, Pierre	New Brunswick
Van Dyke, Ethel	Jamesburg
*Van Gelder, Ruth Eleanor	Long Branch
*Van Liew, Helen May	New Brunswick
Van Mater, Pierre Duclos	Plainfield
*Van Ness, Ethel Marie	Caldwell
Van Nuis, Irene Elizabeth	New Brunswick
Viola, Humbert Emanuel	Cliffside Park
*Voorhees, Mrs. Annie Esdell	Pluckemin
Voorhees, Anson Willard	Montclair
Voorhees, Frederic	New Brunswick
Voorhees, Robert Leland	New Brunswick
*Vosseller, Elizabeth Van Fleet	Flemington
*Vosseller, Hilda Noll	Bound Brook
*Wahlstad, Elsie Marie	Kenilworth
A.B., Upsala College	
Wainright, Katharine Marie	Farmingdale
Waldron, Anne Anderson	New Brunswick
*Walton, Louise Currie	Rutherford
*Wander, Elizabeth H.	Collingswood
Waterfield, John Roland	Irvington
Watman, Albert	Bayonne
*Watson, Mary J.	South Amboy
Wayman, Grace Louise	Stapleton, N. Y.
B.S., Columbia University	
*Webster, Katharyne Frost	Plainfield
*Webster, Mark Allen	Westfield
*Weisert, Katharine Ellen	Jamesburg
*Weishaar, Anna Marie	Elizabeth
*Wells, Mabel H.	New Brunswick
White, Carl Milton	Oxford, Mass.
A.B., A.M., Clark University	
*White, Ralph Hatheway	Camden
A.B., A.M., Clark University	
Whitney, William Graham	Bloomfield
*Widerkehr, Elsie	Irvington
*Wiley, Carrie Anna	German Valley

*Wiley, Ruth Gertrude	German Valley
*Willett, Hope M.	Keyport
*Williams, Adele	Perth Amboy
*Williamson, Martha	Belleville
*Winans, Seymour Gladstone	Flemington
Winchell, Clarence William	Jersey City
*Winn, Mary Edna	Basking Ridge
*Wintrich, Marie A.	Hoboken
Wittig, Emma	New Brunswick
Wolfinger, Mary Elizabeth	Perkasie, Pa.
*Wood, Ethel A.	New Brunswick
*Woodward, Carl Raymond	New Brunswick
B.Sc., Rutgers	
*Woodward, Wilfred Roberts	New Brunswick
Woodward, William Stanley	Englishtown
*Woolverton, Charles Van Syckel	Annandale
*Worle, Helen Smith	New Brunswick
*Worle, Martha Wilson	New Brunswick
*Wray, Permelia E.	New Brunswick
*Wright, Stella Janet	New Brunswick
Zipprich, Anthony E.	New York, N. Y.

Total in Summer Session 626

SHORT COURSES IN AGRICULTURE

Students 1916-1917

G = Course in General Agriculture and Dairy Farming

F = Course in Fruit Growing and Market Gardening

P = Course in Poultry Husbandry

H = Course in Home Economics

Albers, Robert	P	<i>Somerville</i>	134 Redmond St.
Arnold, Frederick Emanuel, Jr.	P	<i>Cape May</i>	26 Baldwin St.
Bailey, Henry Gordon	F	<i>Boonton</i>	Elizabeth
Bailey, Orland Hallinger	G	<i>Camden</i>	21 Jones Ave.
Banker, Helen Margaret	H	<i>New Brunswick</i>	276 George St.
Banks, John Irving	G	<i>Trenton</i>	138 George St.
Banner, Edwin Brown	P	<i>Summit</i>	26 Baldwin St.
Barkalow, William Alexander	G	<i>Freehold</i>	60 New St.
Bartnett, Pierrie Mullin	G	<i>Hampton</i>	15 Mine St.
Barton, Howard Harvey	F	<i>Vineland</i>	87 Commercial Ave.
Bataille, Alfred Henri, Jr.	P	<i>Andover</i>	32 Redmond St.
Bataille, Mrs. Bessie	H	<i>Andover</i>	32 Redmond St.
Bataille, Marius Hortense	G	<i>Andover</i>	32 Redmond St.
Bayer, Philip Adolphis	F	<i>Newark</i>	87 Commercial Ave.
Bialy, Robert C.	G	<i>Collingswood</i>	144 Jones Ave.
Biddle, Edward T.	P	<i>Palmyra</i>	Nichol Ave.
Bindschaedler, Walter, Jr.	G	<i>Bloomfield</i>	18 Handy St.
Blackwell, Cornell	F	<i>Pennington</i>	101 Throop Ave.
Breazeale, Vincent John	F	<i>New Brunswick</i>	259 Delevan St.
Brooks, Norman Wilson	G	<i>Newark</i>	35 Oliver St.
Brown, Roy	G	<i>Jersey City</i>	71 Bishop St.
Buchanan, Edward Crisp	G	<i>Rocky Hill</i>	Rocky Hill
Buchanan, Walter Lewingue	P	<i>Princeton</i>	26 Baldwin St.
Butt, Arthur	F	<i>Paterson</i>	208 Commercial Ave.
Cadmus, Russell	G	<i>Franklin Park</i>	Franklin Park
Carlson, Harry S.	F	<i>Stockton</i>	168 George St.
Clement, Erwin John	G	<i>Lakehurst</i>	71 Bishop St.
Cline, John B.	F	<i>Stewartsville</i>	204 Commercial Ave.
C. E., Lafayette College			
Connolly, Henry Arthur	G	<i>Lyndhurst</i>	35 Oliver St.
Crane, Anson	G	<i>Basking Ridge</i>	150 Townsend St.
Day, Copelin Roe	G	<i>Summit</i>	84 Carroll Place

Demarest, Edward C.	F	<i>Oradell</i>	67 Remsen Ave.
De Raismes, Raoul Henri	G	<i>Elizabeth</i>	Elizabeth
Dye, Raymond Perrin	P	<i>Brielle</i>	38 College Ave.
Ebert, Alan Cuthbert	G	<i>Ashland</i>	208 Commercial Ave.
Egerton, Carl Joseph	F	<i>Oak Ridge</i>	206 Commercial Ave.
Eisenberg, Rose	H	<i>Norma</i>	7 Church St.
Engel, Hermann	P	<i>Hopewell</i>	18 Baldwin St.
Finlaw, Benjamin Hope	G	<i>Canton</i>	55 Suydam St.
Flaig, Gus	F	<i>Guttenburg</i>	82 Neilson St.
Foosaner, Louis	P	<i>Perrineville</i>	82 Neilson St.
Foster, Charles Hamill	F	<i>Bayhead</i>	Nichol Ave.
Frandsen, Ida	H	<i>South River</i>	South River
Franssen, Gerard A.	P	<i>Newark</i>	Newark
Fugazzi, Sadie Marie	H	<i>Hoboken</i>	Hoboken
Golly, Aloise Mathew	F	<i>Ramsey</i>	62 Handy St.
Groendyke, Frank	G	<i>Trenton</i>	Trenton
Guenther, Frank William	G	<i>Brooklyn, N. Y.</i>	Brooklyn, N. Y.
Gulden, Rutledge Pinckney	F	<i>Keyport</i>	9 Remsen Ave.
Hall, Charles Corle	G	<i>Trenton</i>	Trenton
Henry, William	F	<i>Princeton</i>	94 College Ave.
Howell, Roger Fogwill	P	<i>New Glasgow, Va.</i>	71 Bishop St.
Howell, Willard	F	<i>Cranbury</i>	132 George St.
Hoxie, Herbert Gideon	G	<i>Englishtown</i>	177 Ward St.
Ph.B., Union College			
Hoxie, Mrs. Mabel Hinshelwood	H	<i>Englishtown</i>	177 Ward St.
Hubert, William Frederick	P	<i>Elizabeth</i>	Elizabeth
Jensen, Soren Christian	G	<i>Metuchen</i>	Metuchen
Johnson, Enoch	F	<i>Bloomfield</i>	Bloomfield
Johnston, William Saunderson	G	<i>Trenton</i>	Trenton
Journey, Pierre I.	F	<i>Leonia</i>	112 Redmond St.
Konecke, Charles John	P	<i>Hainesville</i>	101 Throop Ave.
Kornblatt, Beatrice	H	<i>Metuchen</i>	Metuchen
Laczko, Theodore	P	<i>New York, N. Y.</i>	29 Handy St.
Lawrence, J. Walter	P	<i>Harmersville</i>	55 Suydam St.
Lewis, Joseph Linn	G	<i>Newton</i>	45 Baldwin St.
Lewis, Lily	P	<i>New Brunswick</i>	236 George St.
Lewis, Winifred	H	<i>Elizabeth</i>	Elizabeth
Lippincott, Alvan Grimshaw	G	<i>Swedesboro</i>	71 Bishop St.
London, Abe	G	<i>Pittstown</i>	College Farm
MacCowatt, Haskell	P	<i>Westfield</i>	Westfield
McCully, Samuel Howard	G	<i>Berlin</i>	55 Suydam St.

McDonough, Elizabeth Agnes	H	<i>Trenton</i>	26 Handy St.
McElhose, Elmer Franklin	G	<i>Irrington</i>	Irrington
McGall, Helen Irene	H	<i>New Brunswick</i>	24 Kirkpatrick St.
McNaught, John Mitchell	P	<i>Jersey City</i>	96 Throop Ave.
Macon, Evelyn Maud	H	<i>New Brunswick</i>	45 Bayard St.
Maple, Carl Lewis	G	<i>Princeton</i>	101 Throop Ave.
Marlott, Russell M.	F	<i>Port Murray</i>	168 George St.
Matthews, Edward R.	G	<i>High Bridge</i>	243 George St.
Molimock, Mrs. Anna	P	<i>New Brunswick</i>	502 Benner St.
Mooney, Charles	F	<i>Flanders</i>	219 Cleveland Ave.
Morris, Arthur	G	<i>New Brunswick</i>	P. O. Box 468
Morris, James Edmond	G	<i>Bayonne</i>	College Farm
Morrow, Leslie MacGill	G	<i>Vineland</i>	73 Carman St.
Mount, George S.	F	<i>Englishtown</i>	82 Neilsón St.
Nesvold, Herbert	G	<i>Jersey City</i>	301 George St.
Nulton, William Marshall, Jr.	G	<i>Roselle Park</i>	Roselle Park
Otterson, Henry Leader	F	<i>Cream Ridge</i>	101 Throop Ave.
Otterson, Irene Chamberlin	P	<i>Cream Ridge</i>	96 Throop Ave.
Pascal, Carl Stephan	G	<i>Rockaway Valley</i>	26 Redmond St.
Perman, David	F	<i>Brooklyn, N. Y.</i>	140 Paterson St.
Petty, Robert Davison, Jr.	F	<i>New York, N. Y.</i>	129 Church St.
Phillips, Willis Newton	G	<i>Jobstown</i>	45 Baldwin St.
Pierson, Edward Read	G	<i>Elizabeth</i>	Elizabeth
Pierson, Willard Searing	G	<i>Morristown</i>	87 Commercial Ave.
Platt, Charles Paul	G	<i>Thorofare</i>	73 Carman St.
Platt, Claude R.	F	<i>Thorofare</i>	73 Carman St.
Powell, Mrs. Alice Prankard	H	<i>West Orange</i>	28 Handy St.
Powell, Lester Beasley	G	<i>West Orange</i>	28 Handy St.
Prokesch, Jacob	P	<i>Kingston</i>	Kingston
Purrington, Noyes Sturtevant	G	<i>Trenton</i>	138 George St.
Quast, Charles Warren	P	<i>Newark</i>	Newark
Reitze, William Bernard John	P	<i>Jersey City</i>	142 George St.
Richards, Frank Lewis	G	<i>Trenton</i>	81 Commercial Ave.
Rogers, Joseph Harrison	G	<i>Pemberton</i>	206 Commercial Ave.
Rogers, Robert Louis	P	<i>Scotch Plains</i>	67 Remsen Ave.
Rosenwach, Jacob	G	<i>Franklin Park</i>	Franklin Park
Schmalz, Frederick William	G	<i>Hoboken</i>	Hoboken
Seese, Paul Allen	P	<i>Canadensis, Pa.</i>	101 Throop Ave.
Segal, Julius M.	P	<i>New Brunswick</i>	106 Cornstock St.
Shearman, Reimer	F	<i>Brooklyn, N. Y.</i>	18 College Ave.
Shoemaker, Earle Cattell	G	<i>Bridgeton</i>	208 Commercial Ave.

Shuart, George	F	<i>Ramsey</i>	62 Handy St.
Smith, Edgar Maddock	G	<i>Orange</i>	Orange
Smith, Theodore Robert	G	<i>Millington</i>	246 George St.
Steelman, Clarence H.	G	<i>Northfield</i>	67 Remsen Ave.
Stiles, William Frederick	F	<i>Springfield</i>	Springfield
Stillwell, Helen Stockton	H	<i>Somerville</i>	10 Kirkpatrick St.
Strong, Dorothy	H	<i>New Brunswick</i>	93 College Ave.
Strong, Ethel Hobart	H	<i>Fanwood</i>	River Road
Tate, Edwin Milton	P	<i>Upper Montclair</i>	28 Redmond St.
Ten Eyck, James Harold	G	<i>Pluckemin</i>	45 Baldwin St.
Tilton, John Henry, Jr.	G	<i>Alenhurst</i>	115 Livingston Ave.
Tine, John Edward	G	<i>Lebanon</i>	38 College Ave.
Tompkins, Christian Milton	G	<i>Newark</i>	Newark
Townley, John	F	<i>Elizabeth</i>	Elizabeth
Trafford, Alden Mason	G	<i>East Orange</i>	18 Livingston Ave.
Vandersloot, Rhoyual Caird	P	<i>Wilmington, Del.</i>	Hamilton Ave.
Van Winkle, Franklin W.	G	<i>Three Bridges</i>	16 Welton St.
Wais, Julius	G	<i>Lebanon</i>	35 Oliver St.
Ward, Gerald Francis	G	<i>Berkeley Heights</i>	Plainsboro
Washburn, Annie Tuttle	F	<i>Princeton</i>	162 Jones Ave.
Weber, Wilfred	P	<i>Irvington</i>	18 Baldwin St.
Welchman, Frank	G	<i>New Brunswick</i>	Clifton Ave.
Wells, Perry	G	<i>Madison</i>	25 Jones Ave.
West, Frank Turnbull	G	<i>Newark</i>	55 Suydam St.
Wigg, Loring	F	<i>Mountainside</i>	Mountainside
Woodruff, Frank Critchfield	F	<i>Green Village</i>	73 Carman St.
Worischek, Bertha	H	<i>Hoboken</i>	94 Suydam St.
Zellers, Raymond Hart	G	<i>Hackettstown</i>	87 Commercial Ave.

Total, Short Courses in Agriculture..... 140

SUMMARY 1916-1917

Graduate Students.....	27
Undergraduates.....	510
Special Students.....	2
Summer Session.....	626
Short Courses in Agriculture.....	140
	<hr/>
	1,305
Names counted twice.....	64
	<hr/>
Total student registration.....	1,241

ASSOCIATIONS OF THE ALUMNI

THE ASSOCIATION OF THE ALUMNI OF RUTGERS COLLEGE

President—Louis F. Bishop '85
Vice-Presidents—Charles S. Aitkin '80
Charles Deshler '85
Secretary—George A. Osborn '97
Treasurer—Henry P. Schneeweiss '77
Biographer—John H. Raven '91
Chief Inspector of Election of Alumni Trustee—Alfred A. Titsworth '77
Assistant Inspectors—Robert H. Neilson '03
Charles P. Wilber '05
Field Secretary—Ralph W. Voorhees '16

Alumni Council

Chairman—Holmes V. M. Dennis, Jr. '94
Vice-Chairman—Charles P. Wilber '05
Secretary—Ralph W. Voorhees '16

Executive Committee

Chairman—Holmes V. M. Dennis, Jr. '94

Douwe D. Williamson '70	Francis B. Sanford '93
Henry P. Schneeweiss '77	Vreeland Tompkins '93
Alfred A. Titsworth '77	John V. N. Dorr '94
Louis Bevier '78	Robert B. Littell '95
Charles S. Aitkin '80	Charles M. Mason '97
Louis F. Bishop '85	George A. Osborn '97
Charles Deshler '85	John W. Mettler '99
Lewis B. Chamberlain '86	Robert H. Neilson '03
Franklin A. Pattison '87	Charles P. Wilber '05
John H. Raven '91	Charles C. Hommann, Jr. '10
Philip M. Brett '92	Earl R. Silvers '13
Robert E. Farley '92	Ralph W. Voorhees '16

Committee on Finances and Funds*Chairman*—John W. Mettler '99

Henry P. Schneeweiss '77	Robert E. Farley '92
Joseph A. Van Mater '80	Vreeland Tompkins '93
Richard T. Greene '89	John V. N. Dorr '94
Morrison C. Colyer '97	

Committee on Secondary Schools*Chairman*—Charles M. Mason '97

Louis Bevier '78	Earl R. Silvers '13
Otto L. F. Mohn '94	Robert W. Searle '15
Ridgway F. Moon '04	George H. Whisler '16

Committee on Undergraduate Activities*Chairman*—Philip M. Brett '92

Charles W. Stevens, Jr. '02	Richard C. Rice '08
Charles P. Wilber '05	Charles C. Hommann, Jr. '10

Committee on Alumni Trustees*Chairman*—Francis B. Sanford '93

Charles S. Aitkin '80	William F. Parker '95
Frank A. Pattison '87	Clarence E. Case '00

Committee on Nominations of Officers*Chairman*—Douwe D. Williamson '70

Alfred A. Titsworth '77	Charles Deshler '85
Rynier J. Wortendyke '82	Richard Morris '99

Committee on Alumni Associations*Chairman*—Lewis B. Chamberlain '86

Charles L. Edgar '82	James L. Garabrant '01
Howard Elting '90	Percy L. Van Nuis '03
Robert B. Littell '95	Walter C. Sedam '09
Harold W. Schenck '13	

Committee on Publicity and Publications*Chairman*—Earl R. Silvers '13

Louis Bevier '78

Jacob G. Lipman '98

John H. Raven '91

John W. Mettler '99

George A. Osborn '97

Augustus H. Shearer '99

Committee on Class Reunions and Organizations*Chairman*—John H. Raven '91

Edward C. Pearson '68

Frank L. Manning '96

La Rue Vredenburg '76

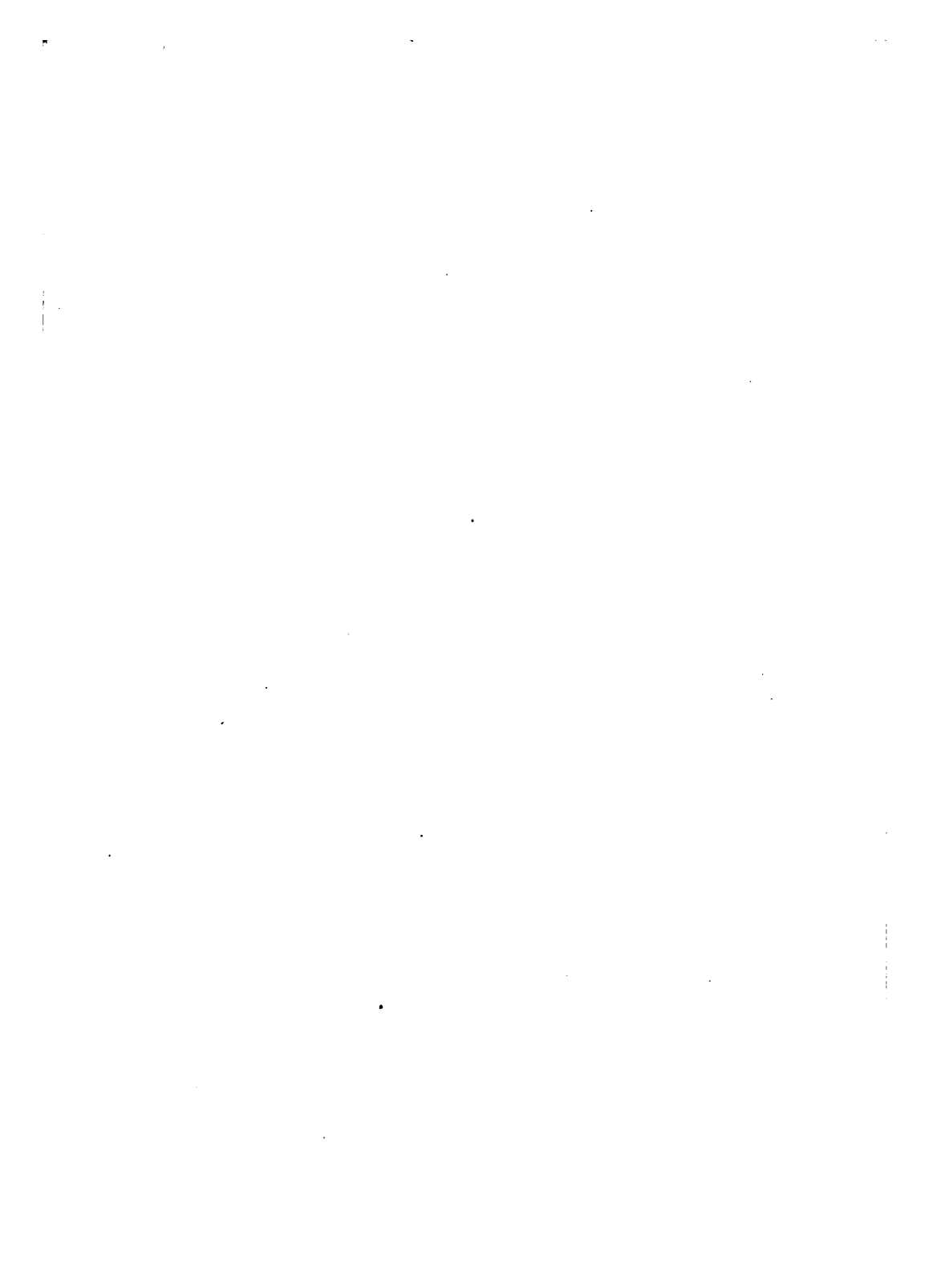
George A. Osborn '97

Alfred F. Skinner '83

Vivian Ross '12

LOCAL ASSOCIATIONS OF THE ALUMNI

Local associations and clubs of the alumni are maintained in New York City, Philadelphia, Chicago, Newark, New Brunswick, and the Mississippi Valley. After the annual elections the lists of officers will be published in the *Alumni Quarterly*.



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